

SEP-14-83001  
83-001-03-TJNT2-11

REPORT TO CONGRESS  
THE IMPACT OF THE  
MEDICARE HOSPITAL PROSPECTIVE PAYMENT SYSTEM

1986 ANNUAL REPORT

OTIS R. BOWEN, M.D.  
SECRETARY  
DEPARTMENT OF HEALTH AND HUMAN SERVICES

## ACKNOWLEDGMENTS

This report was written under the supervision of Joseph Antos, Director of the Health Care Financing Administration's (HCFA's) Office of Research and Demonstrations (ORD) and Michael Fitzmaurice, then Acting Director of the Office of Research in ORD. Stuart Guterman, Chief of the Institutional Studies Branch in the Division of Economics and Reimbursement Studies (DRES) of the Office of Research, coordinated the writing and production of the report.

Chapters 1 and 2 were written by Stuart Guterman. Chapter 3 was written by Stuart Guterman, with sections based on material prepared by Jerry Cromwell, Greg Pope, Ann Hendricks, and Martin Gaynor of Health Economics Research, Inc. Chapter 4 was written by Paul Eggers, Chief of the Program Evaluation Branch in the Division of Beneficiary Studies (DBS) of the Office of Research, with sections based on material prepared by Jon Conklin of Systemetrics, Inc. Chapter 5 was written by Lawrence Kucken and Gerald Riley of DBS and Judith Sangl of DRES, with sections based on material prepared by Lawrence Forgy and Judith Williams of Abt Associates, Inc., and David Klingman of Systemetrics, Inc. Chapter 6 was written by Timothy Greene of DRES. Chapter 7 was written by Sherry Terrell, Chief of the Non-Institutional Studies Branch of DRES, and Margaret Jean Hall and John Petrie of DRES. Chapter 8 was written by Stuart Guterman, with some sections based on material prepared by Andrea Hassol of Abt Associates, Inc.

The authors would like to thank Sydney Galloway of the Office of Operations Support of ORD and Gary Gaumer of Abt Associates, Inc., who served as Project Officer and Project Director, respectively, of HCFA's major PPS evaluation contract, which provided much of the analytic input to this report.

Thanks are also due to the many additional people within HCFA who contributed their labor, data, and comments to the report. Although they are not named here, their contributions are greatly appreciated.

## TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
Executive Summary	
Chapter 1: Introduction	
Background.....	1.1
Methodological Approach.....	1.3
Data Sources.....	1.6
Organization of the Report.....	1.10
Chapter 2: The Medicare Prospective Payment System in FY 1986	
Overview.....	2.1
The Development of Medicare Hospital Payment.....	2.1
Major Features of PPS.....	2.9
Determination of Prospective Payment Rates for FY 1986.	2.13
The PPS Incentive Structure.....	2.20
Discussion.....	2.31
Chapter 3: Impact on Hospitals	
Introduction.....	3.1
Utilization.....	3.3
Intensity of Care.....	3.11
Financial Status.....	3.15
Hospital Management and Cost Control.....	3.24
Hospital Investment and Service Adoption.....	3.29
Summary and Conclusions.....	3.35
Chapter 4: Impact on Medicare Beneficiaries	
Introduction.....	4.1
Beneficiary Access and Utilization.....	4.3
Mortality Trends and Rehospitalization.....	4.14
Beneficiary Liability.....	4.32
Summary and Conclusions.....	4.35
Chapter 5: Impact on Post-Hospital Care	
Introduction.....	5.1
Trends in Post-Hospital Care Utilization.....	5.5
Evaluating the Appropriateness of Post-Hospital Care...	5.23
Procedures for Assuring Quality of Post-Hospital	
Services.....	5.27
Reconsiderations and Appeals.....	5.30
Summary and Conclusions.....	5.32

<u>Title</u>	<u>Page</u>
Chapter 6: Impact on Other Payers	
Introduction.....	6.1
The Health Insurance Market.....	6.3
Sources of Payment for Hospital Care.....	6.4
Medicaid Programs.....	6.6
The Blue Cross and Blue Shield Plans.....	6.8
Commercial Insurance and Self-Insurance Plans.....	6.12
Alternative Payment Systems.....	6.13
Summary and Conclusions.....	6.16
Chapter 7: Impact on Other Providers of Health Care	
Introduction.....	7.1
Outpatient Hospital Services.....	7.3
The Shift in Service Settings.....	7.5
Physicians' Services.....	7.8
Long-Term Care Providers.....	7.10
Summary and Conclusions.....	7.19
Chapter 8: Impact on Medicare Program Operations and Expenditures	
Introduction.....	8.1
Program Operations.....	8.3
Medicare Benefit Payments.....	8.9
Summary and Conclusions.....	8.18



# LIST OF TABLES AND FIGURES

## Tables

<u>Table</u>		<u>Page</u>
Table 2.1a:	Transition to National Payment Rates Under PPS: Hospital-Specific and Federal Portions as a Percentage of Total PPS Rate.....	2.11a
Table 2.1b:	Transition to National Payment Rates Under PPS: Regional and National Portions as a Percentage of Federal PPS Rate.....	2.11a
Table 2.2:	Transition to National Payment Rates Under PPS for Hospital with Cost Reporting Period Beginning January 1.....	2.14a
Table 3.1:	Trends in Medicare Short-Stay Hospital Admissions: Calendar Years 1967-84 and Fiscal Years 1982-86.....	3.3a
Table 3.2:	Trends in Inpatient Hospital Utilization and Capacity: Calendar Years 1979-86.....	3.4a
Table 3.3:	Change in Community Hospital Admissions by Hospital Type: Calendar Years 1983-85.....	3.5a
Table 3.4:	Average Length of Stay for Medicare Beneficiaries in Short-Stay Hospitals (Waiver and Non-Waiver States): Calendar Years 1967-81 and Fiscal Years 1981-86.....	3.6b
Table 3.5:	Changes in Average Lengths of Stay for Medicare vs. Non-Medicare Patients by Hospital Payment Group, 1982-84.....	3.8a
Table 3.6:	Pre- and Post-PPS Trends in Lengths of Stay for "PPS-Eligible" Discharges by Hospital Group..	3.8b
Table 3.7:	Changes in the Distribution of Average Medicare Length of Stay for Urban Hospitals Between TEFRA Year and First PPS Year.....	3.10a
Table 3.8:	Decomposition of Percentage Change in Variance of Average Length of Stay in Urban Hospitals Between TEFRA Year and First PPS Year.....	3.10b
Table 3.9:	Pre- and Post-PPS Trends in Medicare Case Mix Index by Hospital Group: "PPS-Eligible" Discharges Only.....	3.13a

<u>Table</u>	<u>Page</u>
Table 3.10: Special Care Days as a Percentage of Total Inpatient Days by Hospital Type, All Patients, TEFRA Year vs. First PPS Year.....	3.14a
Table 3.11: Medicare Hospital Payments, Costs, and Net Income: First and Second Years Under PPS....	3.16a
Table 3.12: Percent Distribution of Hospitals by Medicare Percentage Net Income: First and Second Years Under PPS.....	3.18a
Table 3.13: Distribution of Hospitals by Positive and Negative Medicare Net Incomes in First and Second Years of PPS.....	3.18b
Table 3.14: Hospital Operating and Total Margins: TEFRA Year Versus PPS Year.....	3.20a
Table 3.15: Frequency Distribution of Operating and Total Margins: TEFRA Year Versus First PPS Year...	3.20b
Table 3.16: Description of Top and Bottom Quartiles of Hospitals in Terms of Operating Margins Under PPS.....	3.21b
Table 3.17: Operating and Total Margins by Hospital Characteristics: TEFRA Year and First PPS Year.....	3.22a
Table 3.18: Examples of Cost Competitive Activities Among Hospitals.....	3.24a
Table 3.19: Percentage Changes in Hospital Investment Measures From TEFRA to First PPS Year, Stratified by Hospital Characteristics.....	3.30a
Table 3.20: Percentage Changes in Service Provision Index From TEFRA Year to First PPS Year, Stratified by Various Hospital Characteristics.....	3.33a
Table 3.21: Trends in Services Offered From TEFRA to PPS Year 1.....	3.34a
Table 3.22: Frequency of Number of MSAs by the Number of Services in the MSA.....	3.34b
Table 4.1: Number and Percent Distribution of Aged Medicare Beneficiaries in PPS States and Waiver States by Age, Sex, and Race, U.S., 1985.....	4.4a

<u>Table</u>		<u>Page</u>
Table 4.2:	Discharges Per 1,000, Average Length of Stay, and Total Days of Care Per 1,000 For Aged Medicare Beneficiaries in the U.S., PPS States and Waiver States, 1980-85.....	4.5a
Table 4.3:	Discharges Per 1,000, Average Length of Stay, and Total Days of Care Per 1,000 For Aged Medicare Beneficiaries in PPS States by Age, Sex, and Race: 1980 through 1985.....	4.7a
Table 4.4:	Discharges Per 1,000 Aged Medicare Beneficiaries and Percent Change for PPS States and Waiver States for the 20 Most Common Diagnosis-Related Groups in 1984: 1984-85.....	4.9a
Table 4.5:	Average Length of Stay for Aged Medicare Beneficiaries and Percent Change for PPS States and Waiver States for the 20 Diagnosis-Related Groups with the Longest Stays in 1984: 1984-85.....	4.9b
Table 4.7:	Number and Percent Distribution of Disabled Medicare Beneficiaries in PPS States and Waiver States by Age and Sex, 1985.....	4.10a
Table 4.8:	Discharges Per 1,000, Average Length of Stay, and Total Days of Care Per 1,000 For Disabled Medicare Beneficiaries in the U.S., PPS States and Waiver States, 1980-1985.....	4.10b
Table 4.9:	Discharges Per 1,000, Average Length of Stay, and Total Days of Care Per 1,000 For Disabled Medicare Beneficiaries in PPS States by Age, Sex, and Race: 1980 through 1985.....	4.11a
Table 4.10:	End-Stage Renal Disease Dialysis Patient Enrollment by Age Group: 1980 to 1985.....	4.12a
Table 4.11:	Discharges Per 1,000, Average Length of Stay, and Total Days of Care Per 1,000 For ESRD Medicare Beneficiaries in PPS States by Age, Sex, and Race: 1980 through 1985.....	4.13a
Table 4.12:	Estimated and Actual Mortality Rates Per 100,000 Aged Population, U.S., 1968-1985.....	4.16a
Table 4.13:	Medicare Disabled Mortality: 1980 to 1985...	4.18a
Table 4.14:	Dialysis Patient Survival, by Year, by Year of Renal Failure.....	4.20a
Table 4.15:	30-Day Post-Admission Mortality: All Medicare Patients.....	4.22a

<u>Table</u>		<u>Page</u>
Table 4.16:	Disease Categories Selected for Inclusion in the Staging Risk-Adjustment Analysis.....	4.25a
Table 4.17:	Classification Results for Diagnostic Category 251: Cerebrovascular Disease (Cerebral or Precerebral Arteries).....	4.27a
Table 4.18:	30-Day Post-Admission Mortality Rates for Medicare: FY 1985, for Selected Disease Categories.....	4.28a
Table 4.19:	Number of Beneficiaries Rehospitalized Within 30 Days of Discharge, Per 1,000 Live Discharges, 1979-85.....	4.31a
Table 4.20:	Aggregate Beneficiary Liability, Liability Per Beneficiary, and Percent Change, 1977-85.....	4.34a
Table 5.1:	Medicare Utilization Statistics for Skilled Nursing Facility and Home Health Agency Services, 1982-1985.....	5.5a
Table 5.2:	Percent Live Hospital Discharges Using SNF and HHA Services Within 60 Days of Discharge and Average Days and Visits Per User, PPS and Waiver States, 1981-85.....	5.6a
Table 5.3:	Distribution of PPS States With Various Levels of SNF and HHA Use Within 60 Days of Hospital Discharge, 1981 and 1984-85.....	5.8a
Table 5.4:	Percent of Live Hospital Discharges Using SNF and HHA Services Within 60 Days of Discharge in the PPS States, by Age, 1981-1985.....	5.9a
Table 5.5:	Percent of Live Hospital Discharges Using SNF and HHA Services Within 60 Days of Discharge in the PPS States, for Selected Frequently Occurring DRGs, 1984-85.....	5.10a
Table 5.6:	Percent of Live Discharges Using SNF and HHA Services Within 60 Days of Discharge bny Length of Stay Reductions, 1981, 1983, 1985.....	5.11a
Table 5.7:	Percent of Live Hospital Discharges Entering SNFs for Various Time Periods Within 60 Days of Hospital Discharge in the PPS States, 1981 and 1984-85.....	5.11b
Table 5.8:	Severity at Admission, Severity at Discharge, and Number of ADL Dependencies, 1982 and 1985....	5.15a

<u>Table</u>	<u>Page</u>
Table 5.9: HHA Use by Level of Discharge Severity and by Number of Dependencies, 1982 and 1985.....	5.15b
Table 5.10: SNF Use by Level of Discharge Severity and by Number of Dependencies, 1982 and 1985.....	5.15c
Table 5.11: Percent of Medicare Beneficiaries Discharged to HHAs and SNFs by Year and Grade of Membership Group, 1982 and 1985.....	5.18a
Table 5.12: Medicare/Medicaid Dually Eligible Beneficiaries: Utilization and Expenditures for Sub-Acute Post-Hospital Services in Michigan and California.....	5.21a
Table 5.13: Part A Case Reviews by Disposition Category, Calendar Year 1986.....	5.31a
Table 6.1: Private Health Insurance by Type of Insurance: Premiums, Benefits, and Market Shares, 1983-1986.....	6.4a
Table 6.2: Personal Health Care Expenditures for Hospital Care by Source of Funds, 1983-1986.....	6.4b
Table 6.3: Catalogue of State Medicaid Systems With Prospective Payment.....	6.7a
Table 6.4: Utilization and Payment Measures for Blue Cross Plans Before and After Implementation of PPS: Average Annual Percent Change for All Blue Cross Plans, Waiver State Plans, and Non-Waiver State Plans.....	6.10a
Table 7.1: Estimated Medicare Share of Total Community Hospital Clinic and Emergency Room Visits....	7.4b
Table 7.2a: Location of Medical and Surgical Services Provided Under Medicare Supplemental Medical Insurance by Percent of Services, 1982-86....	7.5b
Table 7.2b: Location of Medical and Surgical Services Provided Under Medicare Supplemental Medical Insurance by Percent of Reasonable Charges, 1982-86.....	7.5b
Table 7.3: Percentage Distribution of Medicare Physician Allowed Charges by Place of Service: Calendar Years 1982-85.....	7.8a
Table 7.4: Availability of Certified Nursing Facilities by State, 1981 and 1985.....	7.10a

<u>Table</u>		<u>Page</u>
Table 7.5:	Nurses Employed by Participating Home Health Agencies and Enrollees Per Nurse by Census Division: 1985.....	7.10b
Table 7.6:	Growth in the Number of Medicare and Total Certified SNFs and Beds, 1981-86.....	7.11a
Table 7.7:	Growth in Number of Medicare Certified HHAs, 1972-86.....	7.13a
Table 7.8:	Medicare Certified Home Health Agencies by Ownership: 1972-86.....	7.13b
Table 7.9:	HHA Staffing Levels by Specialty, 1982-1986..	7.14a
Table 7.10:	Change in Proportion of Home Health Agencies Providing Various Types of In-Home Services, 1982-86.....	7.14a
Table 7.11:	Growth in Number of Hospitals Approved for Swing-Bed Care.....	7.15a
Table 7.12:	Growth in Number of Medicare Certified Hospices.....	7.15a
Table 8.1:	Status of Medicare Hospitals Under the PPS, FY 1984-86.....	8.3a
Table 8.2:	Total Claims Processed and Percent Denied by FI, by Type of Provider.....	8.6a
Table 8.3:	PRO Denial Rates, by Denial Categories.....	8.8a
Table 8.4:	FI Inpatient Denials and PRO Denial Stringency.....	8.9a
Table 8.5:	Estimated Incurred Medicare Benefit Payments By Type of Provider, FY 1967-86.....	8.9b
Table 8.6:	Distribution of Estimated Incurred Medicare Benefit Payments By Type of Provider, FY 1967-86.....	8.10a
Table 8.7:	Estimated Incurred Medicare Benefit Payments for Inpatient Hospital Services, FY 1967-86..	8.10b
Table 8.8:	Average Annual Rates of Increase in Estimated Incurred Medicare Benefit Payments By Type of Provider.....	8.11a
Table 8.9:	Estimated Incurred Medicare Benefit Payments Under Hospital Insurance (HI) and Supplemental Medical Insurance (SMI), FY 1967-86.....	8.16a

<u>Table</u>	<u>Page</u>
Table 8.10: Total Incurred Medicare Benefit Payments Per Enrollee, FY 1967-86.....	8.17a
Table 8.11: Average Annual Rates of Increase in Medicare HI, SMI, and Total Benefit Payments.....	8.17b

### Figures

<u>Figure</u>	<u>Page</u>
Figure 3.1: Changes in Hospital Admissions by Age Group, 1979-86.....	3.6a
Figure 3.2 Average Length of Stay by Age Group.....	3.7a
Figure 3.3 Hospital Operating Margins and Total Margins Under TEFRA vs. PFS-1.....	3.21a
Figure 5.1: Where Medicare Hospital Patients Go.....	5.7a
Figure 5.2: SNF Admissions Within 7 Days.....	5.19a
Figure 5.3: HHA Visits Within 7 Days.....	5.19b
Figure 7.1a: Community Hospital Outpatient Revenue Per Visit.....	7.4a
Figure 7.1b: Community Hospital Outpatient Total Revenue..	7.4a
Figure 7.2: Outpatient Utilization in General Community Hospitals, 1970-1986.....	7.5a
Figure 7.3a: Distribution of Medicare Allowed Physician Medical Service Charges by Place of Service..	7.9a
Figure 7.3b: Distribution of Medicare Allowed Physician Surgical Service Charges by Place of Service.	7.9a

REPORT TO CONGRESS

IMPACT OF THE  
MEDICARE HOSPITAL PROSPECTIVE PAYMENT SYSTEM

1986 ANNUAL REPORT

EXECUTIVE SUMMARY

Introduction

This is the third in a series of six annual reports by the Department of Health and Human Services (DHHS) to describe and assess the impact of the Medicare Hospital Prospective Payment System (PPS). PPS was enacted by the Congress in the Social Security Amendments of 1983 (Public Law 98-21). Section 603(a) of that legislation requires the Secretary of Health and Human Services to:

...study and report annually to the Congress at the end of each year (beginning with 1984 and ending with 1987) on the impact of the payment methodology under Section 1886(d) of the Social Security Act during the previous year, on classes of hospitals, beneficiaries, and other payors for inpatient hospital services, and other providers, and, in particular, on the impact of computing DRG [diagnosis-related group] prospective payment rates by census division, rather than exclusively on a national basis.



Each annual report is also to include recommendations for such changes in legislation as the Secretary deems appropriate.

In the Omnibus Budget Reconciliation Act of 1986 (OBRA86, Public Law 99-509), the Congress extended the mandate for the annual reports through 1989. Section 9305(i) of OBRA86 requires that each annual report shall include:

- (i) an evaluation of the adequacy of the procedures for assuring quality of post-hospital services furnished under title XVIII of the Social Security Act,
- (ii) an assessment of problems that have prevented groups of medicare beneficiaries (including those eligible for medical assistance under title XIX of such Act) from receiving appropriate post-hospital services covered under such title, and
- (iii) information on reconsiderations and appeals taken under title XVIII of such Act with respect to payment for post-hospital services.

This information is to be included beginning with the 1986 report.

In response to this congressional mandate, DHHS has undertaken a major effort to evaluate the new payment system. This evaluation effort has been designed and implemented with the following objectives in mind:

- o To conduct a systematic evaluation of a policy change that promises to have a dramatic effect on the entire health care system;
- o To describe the behavioral changes occurring among the institutions and individuals that provide, utilize, and pay for health care, particularly among Medicare providers and beneficiaries; and

- o To determine, to the extent possible, the degree to which PPS is responsible for the changes observed since its implementation.

The series of annual reports is based on this effort.

The first report in this annual series (U.S. Department of Health and Human Services, 1985) was devoted primarily to a discussion of the development and major features of PPS, an outline of the methodological approach to be taken in evaluating its impact, and a presentation of early descriptive data on the performance of the health care sector during the first year of prospective payment. The second report (U.S. Department of Health and Human Services, 1987) updated the information presented in the first report and addressed several additional issues that could not previously be addressed, due to the availability of new data and results from several studies that were in their initial or planning stages at the time that the first report was written.

This third report reflects a substantial increase in the volume of available information on the impact of PPS. More time has passed now since the implementation of PPS, so that analysis of pre-PPS versus post-PPS trends can be conducted with increased (although still not complete) confidence that genuine changes, rather than momentary aberrations, are being detected. Studies begun early in the PPS period are beginning to yield results that shed more light on the effects of the new payment system. As has been the case in each report in this series, an attempt has been made to both broaden and deepen the previously presented analysis.

### Methodological Approach

The change from cost-based reimbursement to prospective payment represents a fundamental change in the role of the Medicare program in the health care system. Rather than validating cost increases by reimbursing hospitals for the costs that they have incurred, PPS allows the Federal Government to become a more prudent purchaser of hospital care by paying a fixed price for a known and defined product--the hospital stay. The new payment system is designed to change hospital behavior by directly altering the economic incentives facing hospital decisionmakers.

Hospitals' responses to the incentives facing them under PPS can, in turn, be expected to have a far-reaching effect on the other groups of institutions and individuals that provide, consume, and pay for health care. Medicare beneficiaries are obviously affected by the new payment system, as the quality of the care that they receive, their access to the care that they need, and their out-of-pocket costs for care provided both in the hospital and in other settings are determined by hospitals' responses to PPS incentives.

Other payers for inpatient hospital services may also be affected, as they attempt to avoid a potential shifting of hospital costs from Medicare patients to their own patients and as they respond to the example set by the PPS cost-containment approach. Among other providers of health care, physicians may be affected both as practitioners within the inpatient setting and as providers of potential substitutes for inpatient care, while providers of post-hospital sub-acute care may feel the effects of PPS through an increase in the volume and complexity of services demanded from them. Finally, the effect of the new payment system on the Medicare program itself

is important, since the maintenance of the fiscal solvency of the Medicare Hospital Insurance Trust Fund was the primary impetus for the enactment of PFS.

One of the major problems in evaluating PFS is that of attribution. It is difficult to draw strong causal inferences about the effects of the new system because of the rapidly changing nature of the health care sector. Many changes are occurring that might plausibly account for effects of the sort anticipated under prospective payment. For instance, PFS is but one of many public and private initiatives to control the cost of health care. Also, the rapidly increasing supply of physicians is likely to be an important influence on the effectiveness of efforts to contain health care costs. Thus, both desirable and undesirable effects that might be consistent with expectations about PFS may actually be caused by other factors or--most likely--the joint product of PFS and several other factors.

These considerations require that a great deal of caution be exercised in attributing positive or negative effects to one or another of the many changes occurring in the health care sector. However, although the attribution of effects is clearly a major concern of PFS evaluation effort, its importance should not be overstated. PFS has as its objective the accomplishment of certain desirable changes in the health care system. To the extent that those changes are, in fact, observed, the Medicare program and its beneficiaries can be judged to be better off under the new system--regardless of whether this improvement may be conclusively attributed to any one policy. To the extent that undesirable effects are observed, a problem may be indicated--again, irrespective of the ability to attribute these effects to any one policy. Thus, it may not be necessary to know with certainty that PFS is the cause of the observed changes to be able to develop appropriate policy conclusions.

## Data Sources

The major source of data for this report is the Medicare statistical system. The Health Care Financing Administration (HCFA) collects a rich body of data associated with the utilization and cost of inpatient hospital services and other in-hospital and ambulatory care services covered by Medicare.

Additional sources of data for the FPS evaluation are provided by HCFA-supported contract and grant research activities. These activities have provided many of the analyses of the impact of FPS, as well. Finally, where appropriate, sources of data outside of HCFA are used, including other Government sources, such as the National Center for Health Statistics, and sources in the private sector, such as the American Hospital Association.

Since the objective of this report is to describe and analyze the impact of FPS during its third year (FY 1986), an attempt has been made to incorporate the most recent data available at the time that the analyses were conducted. For some of these analyses, at least preliminary data on FY 1986 were available. For many of the analyses, however, including many of the hospital-level analyses and most of the beneficiary-level analyses, data were not yet available for FY 1986, so FY 1985 data were used. Future reports will update these analyses, as the data permit.

## Findings

### Impact on Hospitals

The hospital industry has undergone tremendous change in recent years. An unprecedented decline in admissions has been observed for both Medicare

and non-Medicare patients. This, combined with the steep decline in average length of stay for Medicare patients as hospitals came under the new system, has resulted in declining inpatient volumes. Despite a decrease in the number of inpatient beds, occupancy rates are at an all-time low, leading to increased competition among hospitals to attract patients. The decline in inpatient volume has not been evenly distributed across hospital types, however; it has been concentrated among small hospitals, putting those hospitals in a particularly disadvantageous position.

The decline in length of stay under FPS has been achieved through shorter stays across-the-board, rather than efforts aimed specifically at patients who have the longest stays (and are, presumably, the most severely ill). The correlation between the financial pressure imposed by FPS and steepness of declines in length of stay provides another indication that FPS has been effective in encouraging hospitals to become more efficient.

The dramatic declines in average length of stay under FPS may be leveling off, however. Among FPS cases only (not including New York and Massachusetts), there has been very little change since the first year of prospective payment. This may reflect an unexpectedly strong initial response to the FPS incentive to shorten lengths of stay. It may also be due to the fact that, since utilization review has diverted many of the less severely ill patients from inpatient to outpatient and other ambulatory care, there has been an increase in the measured severity of illness among those Medicare patients who are admitted to the hospital.

Hospitals have, on average, earned high rates of net income on Medicare patients in the first 2 years under FPS, although the trend seems to be turning downward in the third year. The distribution of these returns is uneven, with urban hospitals faring better than rural hospitals, large

hospitals better than small hospitals, and teaching hospitals better than nonteaching hospitals. Recent changes in the PPS payment rules may have alleviated some of this maldistribution, but the unevenness of the distribution documented here suggests that attempts by the Government to recapture some of these high returns by across-the-board rate reductions must be carefully considered.

Data on hospitals' overall financial performance also indicates that they fared well, at least in the early years of PPS. However, the gap between those hospitals that are doing very well and those that are not is becoming wider--mostly due to the increase in total margins at the high end of the range. A comparison of hospitals at the top of the distribution with those at the bottom indicates that urban and proprietary hospitals, as well as regional referral centers, are disproportionately represented among those with large margins, while sole community hospitals are disproportionately represented among those at the lower end of the range.

In response to the rapidly changing environment facing the hospital industry, hospital administrators report undertaking initiatives in several areas in an attempt to control costs and increase the viability of their institutions. These changes include structural changes (such as eliminating and converting beds to more efficient uses), changes in the use of both labor and nonlabor inputs (such as staffing reductions and skill-mix reconfigurations, wage actions, and group purchasing and computerization of inventory), and organizational changes (such as the hiring of more business-oriented managers and the initiation of intra-facility cost-sharing arrangements).

Finally, the overall rate of investment reported in the Medicare cost reports for the first year of PPS indicates a somewhat slower rate of

investment in fixed assets. However, these data most likely reflect investment decisions made several years prior to the implementation of prospective payment; it will take more time to see the effect of PPS on this aspect of hospital behavior. Moreover, the intensity of fixed assets per bed has increased, indicating that the decrease in patient volume has outstripped the effective reduction in the growth of capital stock. The diffusion of new technology does not appear to have been affected by PPS; many services that have not yet reached some critical level of availability have continued to grow, both in terms of the number of areas in which they are available and the number of hospitals in each area in which they are available.

Specific Findings:

- o Medicare short-stay hospital admissions declined for the third consecutive year in FY 1986, by 4.3 percent; in the first 3 years under PPS, admissions fell by a total of 11.3 percent and admissions per Medicare enrollee by 15.9 percent.
- o Overall community hospital admissions have also declined in recent years, by 10.3 percent since 1983; the number of inpatient days fell by 15.7 percent between 1983 and 1986.
- o The proportion of all community hospital admissions that were aged 65 and older increased from 37 percent to 47 percent between 1979 and 1986.
- o Although the number of staffed beds in community hospitals fell slightly, from 1.004 million to 963 thousand (4.1 percent), between 1983 and 1986, occupancy rates have fallen sharply, from 72.2 percent to 63.4 percent.



- o While community hospitals overall experienced an 8.4 percent decline in admissions between 1983 and 1985, hospitals with less than 50 beds experienced a 22.3 percent decline and hospitals with 50-99 beds a 17.1 percent decline.
- o The average length of stay for all Medicare patients in short-stay hospitals decreased by 3.5 percent in FY 1986, for a total decrease of 17 percent since the implementation of PPS.
- o Average length of stay for community hospital patients under age 65 has been relatively constant, decreasing by only 5.1 percent between 1979 and 1986.
- o Hospitals that were under PPS for their 1984 fiscal years had a 14.6 percent decrease in average length of stay between 1982 and 1984; moreover, an index of the degree of financial pressure imposed by PPS on each hospital is significantly related to the size of this decrease.
- o The distribution of average length of stay across hospitals has not changed much under PPS--hospitals with short stays, on average, before PPS have had about the same decrease as have hospitals with long stays, on average.
- o Average length of stay for PPS discharges only (in the original PPS States) has not decreased much since the first year of prospective payment, averaging only 0.6 percent per year.

- o The Medicare Case Mix Index, which increased sharply with the implementation of PPS in FY 1984, has continued to increase, at an annual rate of 3 percent, between FY 1984 and FY 1986.
- o The percentage of hospital days spent in special care units by Medicare patients increased to 7.1 percent in the first year of PPS, from 6.4 percent in the previous year.
- o Medicare net income per case increased from \$518 to \$550 in the second year under PPS, although this represented a slight decline in Medicare net income percentage, from 13.3 percent to 12.7 percent.
- o Costs per case increased by 11.8 percent, while payments per case increased by 11 percent, in the second PPS year.
- o Urban hospitals had higher Medicare net income percentages than did rural hospitals in the second PPS year (13.6 percent versus 7.8 percent); groups with exceptionally high Medicare net income percentages were large urban hospitals (17 percent for those with 685 or more beds) and major teaching hospitals (18.3 percent).
- o The percentage of hospitals with positive Medicare net incomes fell slightly between the first and second PPS years, from 83.1 percent to 79.2 percent.
- o 100 percent of the largest urban hospitals and 98.1 percent of major teaching hospitals had positive Medicare net incomes; only 67.8 percent of the smallest rural hospitals had positive Medicare net incomes.

- o 72.3 percent of all hospitals with cost reports in both of the first two PFS years had positive Medicare net incomes in both year; only 10 percent had Medicare losses in both years.
- o Of the hospitals that had Medicare losses in the first year under PFS, 40.8 percent had positive Medicare net incomes in the second year; of those that had positive Medicare net incomes in the first year, only 13 percent had Medicare losses in the second year.
- o Overall, U.S. hospitals had their highest recorded profits in the first PFS year, with an average total margin of 7.9 percent, compared with 3.7 percent in the previous year; this represents an increase of \$800,000 per hospital. Total margins have decreased somewhat since then, but they are still higher than they were in the period immediately prior to PFS.
- o Every group of hospitals had positive average total margins in the first year of PFS, although large hospitals (both urban and rural) and hospitals in the Northeast had average total margins greater than 10 percent, and small hospitals (both urban and rural) and hospitals in the West had average total margins less than 5 percent; occupancy rates were also strongly related to financial status.

#### Impact on Medicare Beneficiaries

The Medicare population experienced declines in the overall use of hospital care in both 1984 and 1985. However, the 2 years differed greatly in the nature of the decline. In 1984, there were sharp decreases in length

of stay, evidenced uniformly across beneficiary groups (aged, disabled, and end stage renal disease (ESRD)) and across demographic groups within beneficiary category. In 1985, average lengths of stay fell only slightly, but discharge rates were less consistent. Among the aged, a moderate decline in 1984 was followed by a much larger decline in 1985. Among the disabled, a large decline in 1984 was followed by a more moderate decline in 1985. The ESRD population experienced an increase in discharges rate in 1984 and a small decline in 1985. As a result, the net decline in total days of care since the beginning of FPS was similar for the aged and disabled populations. The decline among ESRD beneficiaries was much smaller.

Although there have been declines in discharge rates among the aged across all age groups, the rate of decline has been lowest among those aged 85 and older. Since the beginning of FPS, persons aged 85 and older have had a decline in discharges that is considerably less than the decline among persons aged 65 to 69. If FPS is reducing access to hospital care, it seems that its impact is least on this most vulnerable group. On the other hand, to the extent that older beneficiaries are at greater risk of premature discharges, then there is potential cause for concern. Length of stay reductions were greatest for the oldest group. Because the need for sub-acute post-hospital care is greatest for older persons, length of stay reductions could pose greater problems for this group.

Among the disabled, the youngest age group had a large decline in discharge rate in 1984. In 1985, this group had an increase in discharges, thus equalizing the net change for this age group from the beginning of FPS with that for other age groups. This seems to be indicative of a general instability in discharge rates from one year to the next and highlights the caution that should be taken when interpreting results for any given year.

Hospital mortality rates for the Medicare population increased between FY 1984 and FY 1985. The fact that total population-based mortality did not change during this time and that there was a large decline in admission rates is strongly suggestive that hospital-based mortality has been affected by the distribution of cases across diagnoses or DRGs. Adjusting the FY 1985 mortality rates according to the disease- or DRG-specific risk of mortality in FY 1984 accounts for about one-half of the increase in hospital mortality between the 2 years. An analysis of changes in mortality rates based on the disease staging methodology developed by SysTeMetrics, Inc., suggests that most, if not all, of the remaining increase in mortality can be explained by the mix of cases across staging groups.

The impact of PPS on beneficiary liability is examined here only from the relatively narrow perspective of Medicare covered services, due to lack of data on other out-of-pocket expenses for Medicare beneficiaries. The most apparent impact of PPS is in the dramatic reduction in the liability per beneficiary for inpatient coinsurance days. There has also been a decline in the rate of growth of other components of beneficiary liability for hospital services, caused by the decrease in both the rate of admissions and the average length of hospital stays for Medicare beneficiaries. Other factors behind this trend include changes in the rules for payment of physicians and a decline in the general rate of inflation.

Specific Findings:

- o The rate of discharges per 1,000 aged Medicare enrollees in 1984 declined by 3.5 percent in the PPS States, compared to a 1 percent increase in the States with waivers from PPS; in 1985, the discharge rate in the PPS

States decreased by 9.6 percent, compared to a 4.6 percent decrease in the waiver States.

- o From 1983 to 1985, the number of inpatient lens extractions decreased by 300,000, accounting for over one-third of the decline in Medicare discharges in that time period.
- o In 1984, there was a 13.2 percent decline in average length of stay among aged beneficiaries in the PPS States, compared to 5.7 percent in the waiver States; in 1985, the decline in average length of stay was about the same in the PPS States (4.0 percent) as in the waiver States (3.3 percent).
- o In the PPS States, the rate of total inpatient hospital days of care per 1,000 aged enrollees decreased by 21.8 percent in the first 2 years of PPS, compared with an 11.1 percent decrease in the waiver States.
- o By age group, the decline in discharge rate was largest (11.1 percent) among the youngest Medicare aged beneficiaries (aged 65-69) in 1985, and smallest (8.4 percent) among the oldest group (aged 85 and older); by race, the decline in discharge rate was larger for whites (9.9 percent) than for non-whites (6.8 percent).
- o Average length of stay decreased by 6.5 percent for the oldest group, compared to only 4 percent for the youngest group.
- o The total days of care rate declined approximately equally across age, race, and sex categories.

- o Among the most commonly occurring DRGs, those with the sharpest declines in average length of stay in the PFS States in 1985 were hip and femur procedures (11.8 percent), major joint procedures (12.8 percent), fracture of the hip and pelvis (12.9 percent), and specific cerebrovascular disorders (11.7 percent); these are DRGs for which post-hospital sub-acute care is commonly needed.
  
- o Among the Medicare disabled population in PFS States, declines in discharge rates, average lengths of stay, and total days of care rates were approximately equal across age, race, and sex categories between 1983 and 1985.
  
- o Among enrollees in the Medicare ESRD program, the youngest groups (those aged 0-14 and 15-24) experienced the largest declines in discharge rate (45.5 percent and 11.2 percent, respectively) between 1983 and 1985, while the oldest group (those aged 65 and older) had an increase of 12.3 percent; since decreases in average length of stay were approximately equal across age groups during this period, total days of care rates reflected the changes in discharge rates.
  
- o The population-based mortality rate for aged persons in 1985 was 5,140 per 100,000; this was somewhat, but not significantly, higher than the rate predicted by a time-trend model of mortality rates since 1979.
  
- o Age-adjusted mortality rates for the Medicare disabled population have increased slightly in recent years, from 2.9 percent in 1982 to 3.2 percent in 1985; this trend began prior to PFS, however, and may be due

to an increase in the average level of disability, due to changing criteria for enrollment.

- o The survival rate among the ESRD dialysis population has declined somewhat in recent years; however, this trend began prior to FPS, and seems to be due to the changing mix of dialysis patients, with increasing numbers of older people receiving dialysis.
- o 30-day post-admission mortality rates for Medicare patients rose from 6.6 percent in FY 1984 to 7.2 percent in FY 1985; however, this increase was accounted for by the decrease in discharges--with the total number of deaths (the numerator in the calculation of the mortality rate) actually decreased by 3 percent, but the decrease in admissions (the denominator) caused the rate to rise.
- o Adjusting for the changing diagnostic mix of patients hospitalized in the 2 years explains about one-half of the increase in 30-day post-admission mortality between FY 1984 and FY 1985.
- o Adjusting for condition-related changes in the risk of death among hospitalized patients, by constructing disease staging categories according to a modified version of the SystemMetrics patient classification technique, fully accounts for the difference between 30-day post-admission mortality rates in FY 1984 and FY 1985.
- o Readmission rates within 30 days of hospital discharge have remained relatively stable in both the FPS and the waiver States.



- o The rate of increase in liability per Medicare beneficiary for deductible and coinsurance amounts has declined sharply under PPS, from 14 percent in 1983 to 5 percent in 1984 and 3 percent in 1985.
- o Medicare Hospital Insurance (HI) liability per beneficiary grew by 5 percent in 1984, down from 16 percent in 1983, due mostly to a decrease in coinsurance liability, caused by the sharp decline in the lengths of hospital stays under PPS; in 1985, HI liability grew by 4 percent.
- o Medicare Supplemental Medical Insurance (SMI) liability per beneficiary grew by 3 percent in 1985, down from 12 percent in 1983; this was largely accounted for by a decrease in liability for unassigned claims.

#### Impact on Post-Hospital Care

The use of home health agency (HHA) services has increased rapidly among Medicare beneficiaries in recent years. This increase in utilization began before the implementation of PPS and has continued since, although at a slower rate of increase. The percentage of beneficiaries using HHA services following hospitalization has increased for all age groups and across States.

The utilization of skilled nursing facility (SNF) services increased following the implementation of PPS, after a period of no increase from 1981 to 1983.

It appears likely that the increase in SNF utilization is related to PPS, but attribution of the increase in HHA utilization is not clear. A time series analysis conducted for HCFA indicated a small effect of PPS on HHA utilization and a larger effect on SNF use.

The findings in this report do not suggest widespread problems with access to post-hospital care under PPS. A few of the studies cited do, however, raise a question as to access to SNF care for the most severely ill and the impaired elderly. SNF utilization by these two groups appears to have declined following PPS, contrary to the overall trend for Medicare beneficiaries. These findings are very preliminary, however, and are based on small samples. Further research is needed to analyze this issue, and data from a national survey (the pilot test of which is currently underway) to evaluate the appropriateness of post-hospital care will provide input into this analysis.

Specific Findings:

- o Use of SNF services by Medicare enrollees increased steadily between 1981 and 1985, from 9.6 admissions per 1,000 enrollees to 11.8 admissions per 1,000 enrollees--an increase of 23 percent.
- o The number of covered days per SNF admission declined from 29.2 days per stay in 1981 to 23.4 days per stay in 1985--a decrease of 20 percent.
- o Use of HHA services also increased, from 33 persons served per 1,000 enrollees in 1981 to 51 persons served per 1,000 enrollees in 1985--an increase of 55 percent.
- o The number of HHA visits per person served fluctuated between 25 and 27 between 1982 and 1985.

- o The percentage of Medicare patients in the PPS States using SNF services within 60 days of a hospital discharge did not change substantially between 1981 and 1983, but increased by 44 percent between 1983 and 1985; in the waiver States, the trend has been erratic, with a 41 percent increase in 1984 followed by a 16 percent decrease in 1985.
- o The number of covered days per SNF user in the PPS States decreased by 21 percent between 1981 and 1985, from 27.4 days to 21.7 days; in the waiver States, there has been essentially no change--25.6 days per SNF user in 1981 and 26 days per SNF user in 1985.
- o The percentage of Medicare patients in the PPS States using HHA services within 60 days of a hospital discharge increased at a very rapid rate immediately prior to PPS--by 55 percent from 1981 to 1983; from 1983 to 1985, the increase was 27 percent--less than the pre-PPS rate of increase, but still very rapid.
- o In the waiver States, there was only a 27 percent increase in HHA use prior to PPS and a slight decrease in the post-PPS period; however, HHA use rates in the waiver States were still somewhat higher in the waiver States than in the PPS States in 1985.
- o The pattern of HHA visits per person served is erratic in both the PPS and the waiver States.
- o The use of SNF services varies considerably across States--out of 47 PPS jurisdictions (46 States and the District of Columbia), 10 had SNF use

rates of less than 1.5 percent in 1984-85 and 22 had rates of 3 percent or more; SNF use rates ranged from a low of 0.1 percent in Mississippi to 7.2 percent in Utah.

- o Use of HHA services also varies widely, although the rate of HHA use has increased dramatically since 1981; HHA use rates ranged from a low of 3.8 percent in Alaska to 23.8 percent in Connecticut in 1984-85.
- o SNF and HHA services are positively correlated at the State level--that is, there does not seem to be substitution of the availability of one for the other across States.
- o By age group, the increase in SNF use between 1983 and 1985 varied from 31 percent for the 85 and over group to 71 percent for the 65 to 74 group; the increase in HHA use varied from 4 percent for the under'65 group to 37 percent for the 75 to 84 group.
- o Patients discharged from hospitals with large length of stay reductions in 1982-84 increased their use of SNF care between 1981 and 1985 by 83 percent; patients discharged from hospitals with small length of stay reductions increased their use of SNF care by only 58 percent.
- o In contrast, patients who were discharged from hospitals with large length of stay reductions increased their use of HHA services by 102 percent, whereas patients discharged from hospitals with small length of stay reductions increased their use of HHA services by 148 percent.

- o Analysis of a sample of Medicare hospital discharges in 1981 and 1984-85 showed that, if a patient was discharged from the hospital in 1981, there was an 0.41 percent chance that the patient would go into a SNF and be covered for 7 or fewer days, while in 1984-85, that chance would have been 0.65 percent; the chance that the patient would go into a SNF and be covered for more than 30 days increased only slightly, from 0.86 percent in 1981 to 0.88 percent in 1984-85.
  
- o According to a study of a sample of hospital records using the MedisGroups severity measure, average severity of illness at both admission and discharge was greater in the post-PFS (1985) sample than in the pre-PFS (1982) sample; the proportion of live discharges with the lowest severity level at admission decreased by 5.6 percentage points, and the proportion with the lowest severity level at discharge decreased by 9.6 percentage points.
  
- o In the MedisGroups sample, the proportion of live discharges with no dependencies in the activities of daily living index decreased from 44.8 percent to 37 percent between 1982 and 1985, while the proportion of discharges with the maximum of five dependencies increased from 23.4 percent to 29.2 percent.
  
- o The highest rate of growth in HHA use in the MedisGroups study was among patients who are less severely ill--the proportion of discharges with the two highest levels of severity according to the MedisGroups measure decreased by 5 percentage points between 1982 and 1985, and the proportions of discharges with the two highest levels of disability

decreased by 5.1 and 0.5 percentage points, respectively. However, this finding is based on a small sample of hospitals, and may not be representative of national trends.

- o The proportion of patients in the MedisGroups study with the lowest level of severity at discharge that used SNF services increased by 1.4 percentage points between 1982 and 1985, while, for high levels of severity, there were decreases of about 10 percentage points; however, patients at both the lowest and highest levels of dependency had decreased SNF use (4.3 percentage points lower for patients with one dependency and 18.8 percentage points lower for those with the maximum of five dependencies).
- o Results of a multivariate analysis of the increase in SNF and HHA use suggest that PPS has increased the percentage of patients receiving HHA visits within 7 days of discharge by 14 percent, while increasing SNF admissions as a percentage of hospital discharges by 65 percent; the increase in SNF admissions was also found to result partially from the increased severity of beneficiaries at hospital admission.
- o A major national study is being developed by HCFA to examine the appropriateness and effectiveness of post-hospital services for Medicare beneficiaries and to determine the nature and extent of problems encountered by patients in obtaining post-hospital care.
- o HCFA is increasing the focus on assuring the quality of post-hospital care, by developing measures within the survey and certification process

for Medicare providers that concentrate on the residents of nursing homes and the services that they receive, by strengthening procedures for quality assurance in the home health setting, and by directing Peer Review Organization (PRO) activities in the direction of post-hospital, as well as in-hospital care.

- o A total of 42,145 reconsiderations hearings and appeals of Part A claim denials were conducted during 1986. Of these, 8,652 (20.5 percent) resulted in full or partial reversal.

#### Impact on Other Payers for Inpatient Hospital Services

During the period coincident with the implementation of PPS, many changes have occurred in the markets for health insurance and health care services. Although Government expenditures for hospital care grew more slowly in 1985 than did private sector expenditures, overall private health insurance premiums grew more over the 1983-86 period than did private health insurance benefit payments.

PPS appears to have had different effects on each payer. State Medicaid programs have increasingly responded to budget pressures by adopting prospective inpatient hospital payment systems in general and DRG-based systems in particular. Medicaid DRG-based systems are clearly modeled on the Federal Medicare system.

Blue Cross plans have moved from retrospective to prospective primary methods of hospital payment between 1981 and 1985. Although these changes cannot be conclusively attributed to PPS, there were statistically significant declines in inpatient utilization growth rates, increases in

outpatient utilization growth rates, and decreases in payment growth rates for Blue Cross subscribers under 65 years of age between the pre-PPS and post-PPS periods.

Increased cost containment activity by commercial insurers, shifts to alternatives such as self-insurance, and growth of alternative payment systems such as health maintenance organizations (HMOs) and preferred provider organizations (PPOs) also characterize the period. There is no strong evidence to attribute these changes to PPS.

Specific Findings:

- o Private health insurance premiums increased by \$31 billion between 1983 and 1986, while total benefits incurred increased by \$24.9 billion.
- o Blue Cross/Blue Shield's and commercial insurers' market shares decreased between 1983 and 1986, by 2.6 and 3.4 percentage points, respectively; self-insured plans and prepaid health plans have increased their shares, by 4.7 and 1.1 percentage points, respectively.
- o Out-of-pocket payments for hospital care grew by 7 percent in 1984 and 5.8 percent in 1985, but this growth rate jumped to 15.9 percent in 1986; the share of hospital payments paid by the patient thus increased to 9.4 percent in 1986, from 8.7 percent in the previous year.
- o Federal Government payments for hospital care grew by 6.3 percent in 1986, down from 9.8 percent in the previous year; the growth rates for Medicare alone were 10.1 percent in 1985 and 5.7 percent in 1986.



- o By April 1982, 14 States had prospective Medicaid systems; by August 1986, this number had increased to 36; 10 of these States had DRG-based payment systems.
- o The share of hospital care expenditures accounted for by Medicaid has been fairly constant over time, at 8.7 percent in 1983 and 8.8 percent in 1986.
- o The number of Blue Cross/Blue Shield plans with a primarily retrospective method of hospital payment decreased from 31 to 19 between 1981 and 1985, while the number with a primarily prospective method increased from 29 to 41.
- o The annual rate of change in the number of hospital admissions per 1,000 Blue Cross/Blue Shield members in the PPS States has decreased from -1.9 percent in the pre-PPS period to -6.2 percent in the post-PPS period; in the waiver States, however, there was also a significant change, from 0.7 percent to -3.4 percent.
- o The annual rate of change in payments for inpatient services per 1,000 Blue Cross/Blue Shield members in the PPS States has decreased from 12.1 percent in the pre-PPS period to 0.3 percent in the post-PPS period; in the waiver States, there was also a significant decrease, but it was much smaller, from 13 percent to 5 percent.
- o Outpatient utilization among Blue Cross/Blue Shield members is rising rapidly in the PPS States, with visits per 1,000 members increasing at an

annual rate of 8.1 percent in the post-PPS period, compared to 3.3 percent in the pre-PPS period.

- o Group policies accounted for a 24.7 percent share of the private health insurance market (as measured by premiums) in 1983, but this share declined to 20 percent by 1986.
- o Approximately 20 percent of individuals with commercial insurance were covered by utilization review provisions in 1986, compared with only about 2 percent in 1984.
- o The market share of prepaid health plans increased from 6.2 percent to 7.3 percent between 1983 and 1986; this represents an increase of 51.5 percent in cumulative premiums.
- o The number of HMOs doubled between 1980 and 1985, while enrollment increased by 115 percent; over 80 percent of this growth was accounted for by an increase in individual practice association (IPA) enrollment.
- o The number of people covered by PPOs increased from an estimated 1.3 million in 1984 to 16.5 million in 1986; about half of all PPO enrollment is concentrated in three States--California, Colorado, and Florida--with California alone accounting for 39 percent.
- o As of mid-1986, 29 percent of PPOs sponsored by Blue Cross/Blue Shield plans, 21 percent of investor-sponsored PPOs, and 18 percent of insurer-sponsored PPOs used DRG-based payment systems.

### Impact on Other Health Care Providers

Ambulatory care continues to be the fastest-growing segment of the health care industry. Outpatient revenue per visit has grown at an accelerated rate since PPS, although the increase in the rate of growth is not statistically significant. With respect to outpatient utilization, both Medicare and non-Medicare outpatient visits declined slightly during the first year of PPS and increased during the second year, but Medicare visits increased by a substantially greater percentage.

Both medical and surgical services provided under Medicare SMI appear to be shifting away from the inpatient setting toward office and outpatient settings. The percentage of reasonable charges for surgery in outpatient settings has increased faster than the percentage of procedures, indicating that more complex procedures are being performed outside of the hospital.

Since the implementation of PPS, the supply of post-acute care providers has increased. Some of this increase may be due to the increased demand for post-acute care brought about by the earlier hospital discharge of Medicare patients. It is also due in part to demographic factors (including the aging of the population), changes in States' Medicaid eligibility and reimbursement policies and, in the case of home health care, to changes in home health coverage under Medicare and to efforts to use home and community-based services wherever possible to avoid premature or inappropriate institutionalization.

The number of Medicare certified SNFs increased in the period following PPS. A study of nursing homes in 10 States indicated that, in homes that served a large number of Medicare patients prior to PPS, the sub-acute care needs of patients increased in the post-PPS period. It appears that these

high-Medicare homes made room for more sub-acute care patients by transferring patients with more chronic long term care conditions and numerous functional limitations to the more traditional nursing homes. Information about staffing and service changes made in nursing homes following PPS should be available for the 1988 PPS Impact Report.

The number of HHAs also increased during this time period. Although part of this increase is believed to be due to changes in Medicare home health coverage legislated in the Omnibus Reconciliation Act of 1980, the increase may also be due to the implementation of PPS and to State Medicaid policies.

Home health patients in the post-PPS period had both an increase in sub-acute care needs and more functional and chronic long term care needs. While this trend may have been partly due to the implementation of PPS, it also may have been a result of the diversion of patients from nursing homes as a result of increased preadmission screening and case management programs.

In the period immediately following PPS, HHAs increased their average staffing levels. However, the average number of staff has since decreased to below the 1982 level. At the same time that staffing was decreasing, the proportion of HHAs offering various types of services was increasing.

The supply of both swing beds and hospices, both relatively new programs, increased substantially since PPS was implemented. It is not possible to say to what extent this growth was due to PPS. We do know that both of these programs tend to be concentrated within certain geographical areas.

Specific Findings:

- o Community hospital outpatient revenue per visit has grown somewhat faster under PPS than would have been predicted by a model based on pre-PPS trends, but this increase is not statistically significant.
- o The number of Medicare emergency room visits increased from 6 million in 1983 to 7.8 million in 1986 (30 percent); all community hospital emergency room visits increased from 79.2 million to 85.4 million (7.8 percent) over that same period.
- o The number of Medicare outpatient clinic visits was 5.9 million in both 1983 and 1986, while all community hospital outpatient clinic visits increased from 42.9 million to 44.9 million (4.7 percent) over that same period.
- o The share of Part B medical services provided to hospital inpatients decreased from 41.3 percent to 31.2 percent between 1982 and 1986--a decrease of 10.1 percentage points; the shares of Part B medical services provided in the outpatient and office settings increased by 1.4 and 8.6 percentage points, respectively.
- o The share of Part B surgical services provided to hospital inpatients decreased from 32.7 percent to 19.8 percent between 1982 and 1986--a decrease of 12.9 percentage points; the shares of Part B surgical services provided in the outpatient and office settings increased by 4.5 and 8 percentage points, respectively.

- o The share of reasonable charges for Part B surgical services provided in the outpatient and office settings increased by 20.4 and 5.9 percentage points, respectively, between 1980 and 1986.
- o The share of Medicare allowed physician charges generated by services provided to hospital inpatients decreased from 60.8 percent to 49.7 percent between 1982 and 1985--the first time that less than half of all physician charges were generated in the hospital.
- o There is substantial geographic variation in the availability of SNF services, with beds per 1,000 Medicare enrollees varying from 16.2 in Arizona to 95.7 in Minnesota; in 1986, over 40 percent of all Medicare certified SNFs were located in five States--California, Pennsylvania, New York, Ohio, and Florida.
- o The number of beds in Medicare and/or Medicaid certified nursing facilities increased by 16.3 percent between May 1984 and November 1986.
- o There is also substantial geographic variation in the availability of HHA services, with Medicare enrollees per home health nurse varying from 529 in New England to 917 in the East North Central region.
- o The number of Medicare certified HHAs grew by 23.9 percent in 1984 and 12.5 percent in 1985; there was only slight growth in this number in 1986.

- o The proportion of HHAs providing such services as physical therapy, occupational therapy, and speech therapy has increased, by 6.6 percent, 20.1 percent, and 13 percent, respectively, between January 1982 and December 1986.
- o The swing-bed and hospice programs have increased rapidly--the number of hospitals approved for swing-bed care increased by 542 percent between 1983 and 1986, and the number of Medicare certified hospices increased by 367 percent over the same time period.

#### Impact on Medicare Program Operations and Expenditures

By FY 1986, 48 States and the District of Columbia were under prospective payment, including some 84 percent of all Medicare participating hospitals. In addition, plans have been developed to bring Puerto Rico under the nationwide system in FY 1988. The number of hospitals and units that have been certified as being excluded from prospective payment is growing, while research is being conducted on how best to include these hospitals under PPS.

In order to monitor the appropriateness, necessity, and quality of care under PPS, 54 PROs have been established, and these PROs have been reviewing medical records in an attempt to detect problems in the way that medical care is provided to Medicare beneficiaries and billed to the program. A SuperPRO has been established, to review the performance of the PROs.

Data on PRO denial rates indicate, however, that there is wide variation in the stringency of PRO review. SuperPRO data further indicate that there is similarly wide variation in the success of the PROs in detecting problems that are indicated by the medical records that they review. The Fiscal

Intermediaries (FIs), whose primary responsibility is the processing and paying of Part A claims, also are responsible for coverage determinations and some medical/utilization review. There is wide variation in FI denial rates, as well, which affects Medicare payments for skilled nursing and home health care, as well as hospital care.

These findings may lead to several alternative conclusions: they may reflect differences in local health care practice; they may reflect differences in the stringency of local PRO or FI review; or they may reflect differences in the level of performance of the local review entities. In any case, it does not appear that such local variation is consistent with the objectives of a nationwide system such as PPS.

PPS appears to have slowed the rate of increase in Medicare inpatient hospital benefit payments. Although this increase is still above the general rate of inflation, it represents a downturn in the rapid growth of inpatient hospital payments that was seen as a major threat to the solvency of the Medicare Trust Funds.

Outpatient hospital payments are increasing at a real rate far greater than their growth rate immediately prior to the implementation of the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA). This may indicate that some of the savings on inpatient services under PPS are being spent on outpatient services. Physician payments have increased at a somewhat slower real rate under PPS than they were before TEFRA, but this slight decrease may be due to the Medicare physician fee freeze that was in effect for much of the early PPS period.

Skilled nursing payments have comprised a steadily decreasing share of total Medicare benefit payments since early in the program. Skilled nursing payments have increased under PPS at a slower rate even than inpatient



hospital payments, but, when compared to the decrease in the pre-TEFRA period, this may indicate a relative increase. The share of home health payments has increased rapidly over the years, however. The real rate of increase in home health payments under PPS is slightly higher than it was in the pre-TEFRA period. That the combined share of skilled nursing and home health payments has increased under PPS may be a response to the expected increase in the demand for post-hospital sub-acute care, but it is hard to tell just from payment data (see Chapters 5 and 7 for more detailed discussions of this issue).

The overall level of Medicare benefit payments is increasing at a slower rate under PPS, due to a sharp decline in the growth of HI payments, while SMI payments are increasing at a somewhat faster real rate than before TEFRA. Medicare benefit payments per enrollee have increased at a real rate that is only about three-quarters of its pre-TEFRA growth rate.

#### Specific Findings:

- o There were 5,657 hospitals being paid under PPS as of the end of FY 1986, up by 314 over the previous year; this comprised some 84 percent of all Medicare participating hospitals.
- o The percentage of all Medicare hospitals that are certified as psychiatric, rehabilitation, alcohol/drug, long-term, or children's hospitals--and thus excluded from PPS--increased from 10.6 percent to 11.4 percent during FY 1986; these hospitals represent only 1.3 percent of all Medicare hospital discharges, however.

- o Denials of inpatient hospital claims by FIs vary from 0.81 percent in the East North Central region to 4.62 percent in the West South Central region; denial rates for SNF claims vary from 8.17 percent in the West South Central region to 52.01 percent in the Mid-Atlantic region.
- o PRO denials of hospital admissions vary from 0.02 percent in Kentucky to 9.78 percent in West Virginia.
- o High denial rates seem to be correlated with high SuperPRO scores, with eight of the fourteen PROs with the highest denial rates having the highest problem detection rates.
- o The increase in Medicare inpatient hospital benefit payments was 4.6 percent in FY 1986--this was the smallest increase in inpatient hospital benefit payments in the history of the Medicare program.
- o The share of benefit payments for inpatient hospital services has been steadily decreasing for the past decade, from 69.5 percent in FY 1975 to 61 percent in FY 1986; the shares of outpatient hospital and physician benefit payments are increasing rapidly, to 7.1 percent and 25.7 percent, respectively, in FY 1986.
- o The real annual rate of increase in inpatient benefit payments in the first 3 years of PPS has been 3.5 percent, down from 7.1 percent in the 5 years immediately prior to TEFRA.

- o The real rates of growth in outpatient hospital, skilled nursing, and home health benefit payments have increased under PPS, at 15.7 percent (compared to 8.8 percent in the 5 years immediately prior to TEFRA), 3.2 percent (compared to -3.5 percent in the pre-TEFRA period), and 12.7 percent (compared to an 11.2 percent pre-TEFRA rate), respectively.
- o The real rate of growth in physician benefit payments has declined slightly under PPS, from 8.9 percent in the pre-TEFRA period to 8.1 percent in the first 3 years of PPS; this, however, is probably due to the physician payment freeze that was in effect for much of the first 2 years.
- o Medicare Part A benefit payments increased by 5.1 percent in FY 1986, but Part B benefit payments increased by 18.3 percent; as a result, total Medicare benefit payments increased by 9.3 percent, which was still the third smallest increase in the history of the program.
- o The real annual rate of increase in Medicare Part A benefit payments in the first 3 years of PPS has been 4 percent, down from 7.3 percent in the 5 years immediately prior to TEFRA.
- o The real rate of growth in Part B benefit payments has increased, from 8.4 percent in the pre-TEFRA period to 10.1 percent under PPS.
- o Total Medicare benefit payments have exhibited a slower rate of growth under PPS--5.9 percent--than in the pre-TEFRA period--7.6 percent.

## Conclusions

The data presented in this report support several conclusions about PPS in its first 3 years. First, the new system has been implemented fairly smoothly; essentially all of the hospitals that were intended to be covered by prospective payment are included in the system. Moreover, two of the four States that were originally waived from participation had joined the nationwide payment system by the end of FY 1986. Second, the implementation of PPS does appear to be affecting the way that hospitals operate--length of stay is down (although it appears to be leveling off), the rate of increase in Medicare costs is down, and practice patterns appear to be changing. Third, hospitals in general appear to have reaped the benefits of their cost-cutting behavior in the form of large operating margins, although more recent data show that these margins have decreased somewhat, and some hospitals have not done as well as others.

It also seems clear that the change in hospital behavior is having an effect now, and will probably have an increasing effect on the other actors in the health care system--Medicare beneficiaries, other payers for inpatient hospital services, and other health care providers. As time passes, these effects will become clearer, both because the parties involved will have had a chance to develop their responses to the new health care environment and because health services researchers both within and outside of the Government will have had additional opportunity to develop data sources and analytic methods that enable them to more accurately assess the impact of the system.

That is the purpose of the future reports in this series: to update the information presented in this report, to monitor the system as it develops for additional study issues that may become relevant, and to develop

the data sources and methodology appropriate for the investigation of the issues that have not yet been addressed.

REFERENCES FOR EXECUTIVE SUMMARY

U.S. Department of Health and Human Services. Report to Congress: The Impact of the Medicare Hospital Prospective Payment System, 1984 Annual Report. Washington, D.C.: 1985.

U.S. Department of Health and Human Services. Report to Congress: The Impact of the Medicare Hospital Prospective Payment System, 1985 Annual Report. Washington, D.C.: 1987.

Chapter 1  
INTRODUCTION

Background

This is the third in a series of six annual reports by the Department of Health and Human Services (DHHS) to describe and assess the impact of the Medicare Hospital Prospective Payment System (PPS). PPS was enacted by the Congress in the Social Security Amendments of 1983 (Public Law 98-21). Section 603(a) of that legislation requires the Secretary of Health and Human Services to:

...study and report annually to the Congress at the end of each year (beginning with 1984 and ending with 1987) on the impact of the payment methodology under Section 1886(d) of the Social Security Act during the previous year, on classes of hospitals, beneficiaries, and other payors for inpatient hospital services, and other providers, and, in particular, on the impact of computing DRG [diagnosis-related group] prospective payment rates by census division, rather than exclusively on a national basis.

Each annual report is also to include recommendations for such changes in legislation as the Secretary deems appropriate.

In the Omnibus Budget Reconciliation Act of 1986 (OBRA86, Public Law 99-509), the Congress extended the mandate for the annual reports through 1989. Section 9305(i) of OBRA86 requires that each annual report shall include:

- (i) an evaluation of the adequacy of the procedures for assuring quality of post-hospital services furnished under title XVIII of the Social Security Act,
- (ii) an assessment of problems that have prevented groups of medicare beneficiaries (including those eligible for medical assistance under title XIX of such Act) from receiving appropriate post-hospital services covered under such title, and
- (iii) information on reconsiderations and appeals taken under title XVIII of such Act with respect to payment for post-hospital services.

This information is to be included beginning with the 1986 report.

In response to this congressional mandate, DHHS has undertaken a major effort to evaluate the new payment system. This evaluation effort has been designed and implemented with the following objectives in mind:

- o To conduct a systematic evaluation of a policy change that promises to have a dramatic effect on the entire health care system;
- o To describe the behavioral changes occurring among the institutions and individuals that provide, utilize, and pay for health care, particularly among Medicare providers and beneficiaries; and
- o To determine, to the extent possible, the degree to which PPS is responsible for the changes observed since its implementation.

The requirement for an annual series of reports reflects the recognition that the impact of PPS cannot be conclusively evaluated at one point in time. Until the new system has been fully implemented and the affected parties have had sufficient time to respond, its ultimate effects will not be evident.



The first report in this annual series (U.S. Department of Health and Human Services, 1985) was devoted primarily to a discussion of the development and major features of PPS, an outline of the methodological approach to be taken in evaluating its impact, and a presentation of early descriptive data on the performance of the health care sector during the first year of prospective payment. The second report (U.S. Department of Health and Human Services, 1987) updated the information presented in the first report and addressed several additional issues that could not previously be addressed, due to the availability of new data and results from several studies that were in their initial or planning stages at the time that the first report was written.

This third report reflects a substantial increase in the volume of available information on the impact of PPS. More time has passed now since the implementation of PPS, so that analysis of pre-PPS versus post-PPS trends can be conducted with increased (although still not complete) confidence that genuine changes, rather than momentary aberrations, are being detected. Studies begun early in the PPS period are beginning to yield results that shed more light on the effects of the new payment system. As has been the case in each report in this series, an attempt has been made to both broaden and deepen the previously presented analysis.

### Methodological Approach

#### Context

The change from cost-based reimbursement to prospective payment represents a fundamental change in the role of the Medicare program in the

market for health care. Rather than validating cost increases by reimbursing hospitals for the costs that they have incurred, PPS allows the Federal Government to become a more prudent purchaser of hospital care by paying a fixed price for a known and defined product--the hospital stay. The new system is designed to change hospital behavior by directly altering the economic incentives facing hospital decisionmakers.

Hospitals' responses to the incentives facing them under PPS can, in turn, be expected to have a far-reaching effect on the other groups of institutions and individuals that provide, consume, and pay for health care. Medicare beneficiaries are obviously affected by the new payment system, as the quality of the care that they receive, their access to the care that they need, and their out-of-pocket costs for care provided both in the hospital and in other settings are determined by hospitals' responses to PPS incentives.

Other payers for inpatient hospital services may also be affected, as they attempt to avoid a potential shifting of hospital costs from Medicare patients to their own patients and as they respond to the example set by the PPS cost-containment approach. Among other providers of health care, physicians may be affected both as practitioners within the inpatient setting and as providers of potential substitutes for inpatient care, while providers of post-hospital sub-acute care may feel the effects of PPS through an increase in the volume and complexity of services demanded from them. Finally, the effect of the new payment system on the Medicare program itself is important, since the maintenance of the fiscal solvency of the Medicare Hospital Insurance Trust Fund was the primary impetus for the enactment of PPS.

### Attributing Causality

One of the major problems in evaluating PPS is that of attribution. It is difficult to draw strong causal inferences about the effects of the new system because of the rapidly changing nature of the health care sector. Many changes are occurring that might plausibly account for effects of the sort anticipated under prospective payment. For instance, PPS is but one of many public and private initiatives to control the cost of health care. Also, the rapidly increasing supply of physicians is likely to be an important influence on the effectiveness of efforts to contain health care costs. Thus, both desirable and undesirable effects that might be consistent with expectations about PPS may actually be caused by other factors or--most likely--the joint product of PPS and several other factors.

In addition, the nationwide scope of the new system precludes the existence of a natural "control," or comparison test, group. The four States (Maryland, Massachusetts, New Jersey, and New York) that were originally waived from participation in the nationwide system were explicitly excluded on the grounds of participation in other cost-containment experiments. Thus, although they are sometimes used to compare trends over time, the waiver States do not constitute a true control group.<sup>1</sup>

The considerations mentioned above require that a great deal of caution be exercised in attributing positive or negative effects to one or another of

---

<sup>1</sup>Because Massachusetts and New York both entered the nationwide system during FY 1986 (see Chapter 2), a comparison of these two States with the other original waiver States on the one hand and the original PPS States on the other might be interesting. However, since Massachusetts and New York are distinctly atypical in many ways (for instance, their Medicare average lengths of stay for short-stay hospitals were 32 and 54 percent above the national average in FY 1985, respectively), these comparisons probably would not shed much light on the impact of PPS.

the many changes occurring in the health care sector. However, although the attribution of effects is clearly a major concern of PPS evaluation effort, its importance should not be overstated. PPS has as its objective the accomplishment of certain desirable changes in the health care system. To the extent that those changes are, in fact, observed, the Medicare program and its beneficiaries can be judged to be better off under the new system--regardless of whether this improvement may be conclusively attributed to any one policy. To the extent that undesirable effects are observed, a problem may be indicated--again, irrespective of the ability to attribute these effects to any one policy. Thus, it may not be necessary to know with certainty that PPS is the cause of the observed changes to be able to develop appropriate policy conclusions.

#### Data Sources

##### Medicare Statistical System

The major source of data for this report is the Medicare statistical system. The Health Care Financing Administration (HCFA) collects a rich body of data associated with both Medicare Hospital Insurance (HI, or Part A) and Medicare Supplemental Medical Insurance (SMI, or Part B). These data are generated for several purposes:

- o To certify Medicare providers or suppliers;
- o To verify the eligibility and/or deductible status of beneficiaries;
- o To determine payment for the episode of care;
- o To review the medical necessity and appropriateness of the care provided;

- o To monitor the performance of the fiscal intermediaries and medical review entities;
- o To provide descriptive program statistics; and
- o To support program research, development, and evaluation.

In order to fulfill these multiple purposes, the data are organized into many different data files. The data files most useful in the analysis of the impact of PPS are the Medicare Provider Analysis and Review (MedPAR) file, the Hospital Cost Report Information System (HCRIS), the Part B Medicare Annual Data (BMAD) file, and the Health Insurance Skeleton Eligibility Write-Off (HISKEW) file.

The MedPAR file contains selected billing, demographic, and provider information on hospital stays for all Medicare beneficiaries. Prior to October 1983, the MedPAR file only included a 20 percent sample of beneficiaries. For each hospital stay, data on diagnostic category, surgical procedures performed, length of stay, charges, and amount reimbursed are recorded. This file serves as a source for many of the patient-based analyses of the impact of PPS.

The HCRIS is a national data base of hospital financial and statistical data generated from the Medicare cost reports. These data include hospital characteristics, the number of admissions, discharges, and patient days for all patients, Medicare patients, and Medicaid patients, and revenues, charges, and costs overall and by cost center. This file is used to provide data on Medicare hospital revenues, costs, and net operating margins.

The BMAD system consists of four files: a procedure file, a prevailing charge file, a provider file, and a beneficiary file. These files contain, respectively, data on procedures performed under Part B, the prevailing

charge limits for each service, the claims history of procedures rendered by a one percent sample of physicians, and the claims history of services received by all beneficiaries with end-stage renal disease (ESRD) and a 5 percent sample of other beneficiaries. These files are used to describe trends in the utilization and setting of Part B services.

The HISKEW file is a condensed version of the Health Insurance Master File, containing entitlement data for all Medicare beneficiaries. Each beneficiary's coverage under Parts A and B, along with selected demographic data, are listed on this file, which is updated quarterly. This file is used to measure Medicare enrollment levels and is the most reliable source of data on the date of death for studies of mortality rates.

#### Other HCFA Data

Several other data files maintained or produced by HCFA have been used to support specific PPS impact analyses. The Medicaid Statistical Report on Medical Care consists of data submitted annually by each State, describing Medicaid enrollment, utilization, and payments. These data are used to analyze trends in Medicaid utilization and expenditures under PPS. Data on the operations of the 54 Utilization and Quality Control Peer Review Organizations (PROs) nationwide are provided by the PRO Medical Review Activity Report. Published estimates of national health care expenditures by type of payer and Medicare benefit payments by type of provider are obtained from HCFA actuarial data.

## Data from HCFA Contractors and Grantees

Several additional sources of data for this report have been generated by HCFA-supported contract and grant research activities. Among these are the following:

- o As part of a large-scale evaluation of the impact of PPS, Abt Associates, Inc., and Health Economics Research, Inc., have conducted a series of ten case studies of areas around the country. Although no systematic collection of numerical data was involved, these case studies provide a unique insight into the responses of the health care system to the dramatic changes that have recently been taking place.
- o Hospital discharge abstract data from the Commission for Hospital and Professional Activities (CPHA) have been used to describe trends in the discharge destinations of Medicare and non-Medicare patients and to analyze several indicators of the quality of inpatient care.
- o The Blue Cross and Blue Shield Association has collected membership, utilization, and cost data from most of its member plans across the country, for use in the analysis of the impact of PPS and other cost-containment initiatives on the largest of the non-Federal payers for inpatient care.

Additional data from these sources may be available for forthcoming reports, and several HCFA-sponsored activities now underway will expand this list in the future. In addition, the HCFA grants solicitation process encourages the submission of proposals for new PPS-related research, especially that based on data not otherwise available for the evaluation of PPS.

## Other Data Sources

Data for the analyses contained in this report have been obtained from other sources, as well. The American Hospital Association (AHA) conducts a monthly survey of a panel of 1,600 hospitals, of whom about 1,200 respond in any given month. This survey provides timely data on hospital admissions, length of stay, hospital revenues and costs, profit margins, and staffing levels. Data from an annual hospital survey conducted by the AHA are viewed as being more accurate, but are not available on as timely a basis as are data from the monthly survey.

Data on mortality trends are obtained from the National Center for Health Statistics (NCHS). These data serve as a check on the Medicare mortality data, and also provide a long-standing time series for the analysis of nationwide and age-specific mortality rates.

## Organization of the Report

This report is organized into two major parts. The first two chapters are introductory, while the remaining six chapters present current data on the implementation of PPS and an analysis of its impact.

Following this chapter, which contains a brief discussion of the background of the PPS evaluation effort, the methodological approach, and the major sources of data, the historical development of Medicare hospital payment is reviewed in Chapter 2, along with the major design features of PPS. A discussion of the incentives presented by prospective payment and the anticipated responses to those incentives is also presented in Chapter 2.



Chapters 3 through 8 of this report present data on the impact of FFS on hospitals, Medicare beneficiaries, access to and quality of post-hospital care, other payers for inpatient hospital care, other providers of health care, and Medicare program operations and expenditures, respectively. The emphasis is on describing and analyzing the changes observed since FFS was implemented in October 1983.

# REFERENCES FOR CHAPTER 1

U.S. Department of Health and Human Services. Report to Congress: The Impact of the Medicare Hospital Prospective Payment System, 1984 Annual Report. Washington, D.C.: 1985.

U.S. Department of Health and Human Services. Report to Congress: The Impact of the Medicare Hospital Prospective Payment System, 1985 Annual Report. Washington, D.C.: 1987.

## Chapter 2

### THE MEDICARE PROSPECTIVE PAYMENT SYSTEM IN FY 1986

#### Overview

The purpose of this chapter is to briefly trace the evolution of Medicare hospital payment from the origins of the program through prospective payment and to describe the system's current status, in order to provide a context for the interpretation of the findings presented in Chapters 3 through 8.

The chapter begins with a description of the development of Medicare hospital payment, from the enactment of the Social Security Amendments of 1965 through the provisions of the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) and the creation of Medicare prospective payment (PPS) by the Social Security Amendments of 1983. The major features of the prospective payment system are then reviewed, focusing on the types of facilities and services included in and excluded from prospective payment and the determination of the prospective payment rates. These features are updated through FY 1986. The concluding section is a discussion of the incentives provided by prospective payment, and the impact that these incentives are likely to have on the behavior of hospitals, Medicare beneficiaries, other payers for hospital care, and other health care providers.

#### The Development of Medicare Hospital Payment

##### Early Development

The Social Security Amendments of 1965 (Public Law 89-97) established Title XVIII of the Social Security Act, which authorized the creation of the

Medicare program to provide comprehensive health care coverage for most Americans over the age of 65. Part A of Title XVIII (Hospital Insurance (HI)) provides basic health insurance protection against the costs of inpatient hospital care and skilled nursing and home health care. Part B of Title XVIII (Supplemental Medical Insurance (SMI)) provides voluntary supplemental insurance covering most physician services and certain other items and services not covered under Part A.

The method of payment for hospital services that was adopted by the Medicare program was a retrospective cost-based reimbursement system, modeled after the private insurance practices that prevailed at the time. Under this system, hospitals were reimbursed for any reasonable costs that they incurred in the provision of covered care to Medicare beneficiaries. With the implementation of the Medicare program, there was a sharp increase in the utilization of health care services by the elderly, and a similarly sharp rise in health care costs. Between 1965 and 1967, Federal health care expenditures more than doubled.

The Social Security Amendments of 1967 (Public Law 90-248) authorized the Department of Health, Education, and Welfare (now the Department of Health and Human Services (DHHS)) to study the impact of extending benefits under the Medicare program to certain medically disadvantaged groups, such as persons who are disabled and persons with end-stage renal disease (ESRD). In addition, DHHS was authorized to develop and test alternatives to retrospective cost-based reimbursement that might be more effective in controlling the rapid increase in Federal health care expenditures.

Between FY 1967 and FY 1971, Medicare hospital benefit payments doubled. Although this increase was due in large part to the improved access to health care provided by the program, it prompted both Federal and private

researchers to increase their efforts in the development of alternative hospital payment mechanisms that could increase control over costs while continuing to make health care available to a growing beneficiary population. The Economic Stabilization Program, put into effect in 1971 to temporarily suppress the inflation that was plaguing the economy in general, slowed the rate of increase in hospital costs somewhat.

#### Expansion of the Program

The Social Security Amendments of 1972 (Public Law 92-603) extended Medicare coverage to disabled workers and persons with ESRD, and permitted those persons aged 65 and over who were not otherwise eligible for HI to obtain this coverage by paying the full premium. At the same time, several utilization and quality control measures were mandated:

- o Professional Standards Review Organizations (PSROs) were established, in an attempt to reduce the unnecessary utilization of hospital services while maintaining the quality of care;
- o Health maintenance organizations (HMOs) were included among Medicare-covered providers, to take advantage of the reduced rate of hospital utilization demonstrated by these plans;<sup>1</sup> and
- o DHHS was authorized in Section 223 of the 1972 Amendments to determine prospectively set limits on providers' reasonable costs and to deny

---

<sup>1</sup>Under this law, each HMO was to be reimbursed an amount based on a comparison of its own costs with the average cost of providing covered services to Medicare beneficiaries in the same geographic area with the same characteristics as its own enrollees. Under the provisions of TEFRA (see below), prospective payment under risk-sharing contracts with HMOs was authorized.

reimbursement to hospitals for costs exceeding these limits. DHHS subsequently set per diem limits on routine inpatient operating costs for hospital groups defined according to urban or rural location and size.

In addition, the 1972 Amendments mandated the expansion of research and experimentation in order to determine the advantages and disadvantages of making payments to Medicare providers on a prospective basis.

When the temporary Economic Stabilization Program was terminated in 1974, the rapid increase in hospital inpatient costs resumed. The National Health Planning and Resources Act of 1974 (Public Law 93-641) was enacted, authorizing the establishment of community health planning agencies and requiring hospitals to obtain a certificate of need (CON) for each capital project. This legislation also authorized DHHS to set limits on hospital charges and routine costs.

Between 1974 and 1977, Federal health care expenditures rose by more than 50 percent, to a level four times as high as it was when Medicare was implemented in 1967. Research and experimentation on cost-containment strategies were intensified: State rate-setting programs were proving more effective than cost-based reimbursement, while broader Federal regulations, represented by the PSROs and the CON requirement, appeared to have little impact. In 1977, Federal health care financing programs were consolidated under the newly created Health Care Financing Administration (HCFA), which was made responsible for administering the Medicare and Medicaid programs and ensuring their quality and effectiveness.

In 1978, a system of voluntary cost-control efforts by the hospital sector reduced the rate of increase in hospital expenditures; however, these voluntary controls proved to be only temporarily effective. By 1980,

Medicare hospital expenditures were rising as rapidly as they had been before--and, as the proportion of elderly persons in the population continued to increase, the HI Trust Fund<sup>2</sup> was forecast to be in danger of insolvency by the end of the decade.

#### TEFRA

In response to the serious concerns about the solvency of the Medicare program, TEFRA (Public Law 97-248) contained several provisions aimed at increasing the program's control over its hospital payments. One of these provisions extended the hospital cost limits authorized by Section 223 of the 1972 Amendments, which had previously been applied only to routine inpatient operating costs, to cover the total operating costs of inpatient hospital services per Medicare discharge. Thus, the emphasis in Medicare payment was shifted from per-diem to per-case costs. The TEFRA cost limits were to take into account the diagnostic mix of Medicare cases treated at each hospital.

Another provision of TEFRA placed a limit for 3 years on the annual rate of increase in Medicare-reimbursable costs per discharge--providing for penalties for hospitals exceeding those limits and incentive payments for hospitals incurring operating costs below the target amounts.

In addition, a system of 54 Utilization and Quality Control Peer Review Organizations (PROs) was established (one for each State, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam/American Samoa), to

---

<sup>2</sup> The Medicare program is financed by two trust funds: Part A benefits are paid out of the HI Trust Fund, which is funded by the Medicare portion of the Social Security (FICA) tax deducted from the paychecks of eligible workers; Part B benefits are paid out of the SMI Trust Fund, which is funded by the premiums charged to the voluntary enrollees in this program, as well as an amount contributed from general tax revenues.

review health care services and items provided to Medicare patients, for the purpose of determining whether:

- o Such services are reasonable and medically necessary;
- o The quality of such services meets professionally recognized standards; and
- o Services provided on an inpatient basis could be provided in an appropriate manner and more economically on an outpatient basis.

The PROs were to take the place of the then-existing PSROs, with increased authority and more emphasis on the quality of care.

DHHS was also required by the provisions of TEFRA to develop, in consultation with the Senate Committee on Finance and the House of Representatives Committee on Ways and Means, a legislative proposal for Medicare payment to hospitals, skilled nursing facilities (SNFs), and, to the extent feasible, other providers on a prospective basis. In partial response to this requirement, a proposal on hospital prospective payment for Medicare was submitted to the Congress in December 1982 (U.S. Department of Health and Human Services, 1982).

#### The Rationale for Prospective Payment

This brief sketch of the development of Medicare hospital reimbursement indicates that, from very early on, it was apparent that cost control was one of the Medicare program's major shortcomings. Although some growth in Federal health care expenditures could be anticipated as a result of the improved access to care provided by Medicare and Medicaid, as well as several



other factors that may not be undesirable from the program's point of view, the rate of cost increase far exceeded that which was anticipated or which could be considered acceptable.

The evolution of Medicare hospital reimbursement largely represents a series of attempts to increase control over these rapidly rising costs. However, from the earliest efforts to control Medicare costs through the enactment of the Section 223 and TEFRA cost limits, Medicare payment continued to be based primarily on retrospective cost reimbursement principles.

Since, under retrospective cost-based reimbursement, higher hospital costs resulted in larger hospital payments, there was no incentive for hospitals to operate more efficiently. The development of a prospective payment system for Medicare was predicated on the notion that the existing reimbursement principles could not be modified to a sufficient degree to effectively control costs, and that a fundamental change was needed.

As mentioned earlier, dissatisfaction with retrospective cost-based reimbursement was evidenced very early in the history of the Medicare program. The Social Security Amendments of 1967 authorized DHHS to develop and test alternatives to the existing payment system. Beginning in 1972, several demonstrations had been conducted for the purpose of evaluating a wide variety of alternative payment systems. These demonstrations established that mandatory prospective payment-type systems were generally effective in holding down the rate of increase in hospital costs. Ten years of experience with these demonstrations<sup>3</sup> and extensive research on the reform of the Medicare hospital payment system indicated that prospective

---

<sup>3</sup> A summary of findings on the effects of these demonstrations is found in Coelen and Yaffee (1984).

payment was a viable alternative to the retrospective cost-based reimbursement system then in effect.

#### The Social Security Amendments of 1983

The Social Security Amendments of 1983 (Public Law 98-21) provided for Medicare payment for inpatient hospital services under a prospective payment system, rather than the previous retrospective cost-based reimbursement system. Under PPS, payment is made at a predetermined, specific rate for each discharge, according to the diagnosis-related group (DRG) in which the discharge is classified. The prospective payment rate does not include capital-related costs (e.g., depreciation, taxes, rent) or direct medical education costs, which continue to be reimbursed on a reasonable cost basis.<sup>4</sup>

The 1983 Amendments also reiterated the thrust of the PRO program and, at the same time, specified functions within the TEFRA authority to determine the reasonableness, medical necessity, and appropriateness of care provided to Medicare beneficiaries. Those functions are to review:

- o The validity of diagnostic and procedural information provided by hospitals;
- o The completeness, adequacy, and quality of care provided;
- o The appropriateness of admissions and discharges; and
- o The appropriateness of care for which outlier payments (additional payments for exceptionally long or costly cases) are made.

---

<sup>4</sup>Effective for cost reporting periods beginning on or after July 1, 1985, reimbursement for the direct costs of graduate medical education for interns and residents is to be on a per intern and resident basis, rather than a reasonable cost basis.

Each PPS hospital was required by law to enter into a contract with the PRO for its State or area.

In addition, the 1983 Amendments required that certain demonstration projects be conducted to investigate alternative approaches to Medicare payment, and that several reports be submitted to the Congress on specified areas of study related to the impact, refinement, and extension of Medicare prospective payment.

### Major Features of PPS

#### Applicability

PPS applies to all inpatient hospital services furnished by all hospitals participating in the Medicare program, except for hospitals participating in approved demonstration projects, State reimbursement control programs, or regional demonstrations, and certain types of hospitals or units specifically excluded from prospective payment (see below). It replaces the retrospective cost-based reimbursement system previously in effect and supersedes the cost per case limits and rate of increase ceilings established by TEFRA. However, payments under PPS were required to be "budget-neutral" with respect to TEFRA through FY 1985--that is, PPS payments for each of the first 2 years of the new system were to be no more and no less than those projected under TEFRA's provisions.

The prospective payment rate for each case applies to Medicare Part A inpatient operating costs, which include the costs of routine (room, dietary, and nursing) services, ancillary services, and services provided in special care units. This rate is to be considered payment in full for the operating

costs generated by the case, and hospitals are prohibited from billing beneficiaries for more than the statutory deductible and coinsurance amounts.

Capital costs, direct medical education costs, and kidney acquisition costs incurred by approved renal transplantation centers, as well as outpatient costs and the cost of physician inpatient services, continue--for the time being--to be reimbursed by Medicare on a retrospective basis.<sup>5,6,7</sup>

#### Implementation and Phase-In

Each hospital participating in the Medicare program, except for those hospitals specifically excluded from FPS, became subject to prospective payment beginning with its first cost reporting period starting on or after October 1, 1983. In order to facilitate the transition to FPS, the system was originally scheduled to be implemented over a 3-year phase-in period, during which a declining portion of the total prospective payment rate<sup>8</sup> for cases treated at each hospital would be based on the hospital's own historical level of costs. This hospital-specific rate would be combined with a Federal rate, which, in turn, is a combination of the appropriate regional and national rates (based, respectively, on average costs in the hospital's own geographic region and nationwide average costs).

---

<sup>5</sup> HCFA has proposed a methodology for including capital costs in the prospective payment rate beginning in FY 1988.

<sup>6</sup> Effective for cost reporting periods beginning on or after July 1, 1985, reimbursement for the direct costs of graduate medical education for interns and residents is to be on a per intern and resident basis, rather than a reasonable cost basis.

<sup>7</sup> Beginning in FY 1987, heart transplants performed at approved heart transplantation centers are covered under Medicare. Heart acquisition costs are reimbursed on a retrospective basis, similar to the method of reimbursement for kidney acquisition costs.

In a series of legislative actions culminating in the Consolidated Omnibus Budget Reconciliation Act of 1985 (Public Law 99-272), PPS regulations in effect on September 30, 1985 were continued through April 30, 1986, and the PPS phase-in period was extended by 1 year (except for hospitals located in Oregon).

According to the current phase-in schedule, the hospital-specific and Federal rates are to be combined as shown in Table 2.1a. While the blend of hospital-specific and Federal rates is determined by the individual hospital's cost reporting period, the blend of regional and national rates is determined by the Federal fiscal year, as shown in Table 2.1b.

There are currently 18 different sets of regional rates, corresponding to urban and rural areas in each of the nine census regions, and two sets of national rates, one each for urban and rural hospitals nationwide. Beginning in FY 1988, the fifth year of PPS, Medicare prospective payment rates are based only on the urban or rural national rate per discharge.<sup>8</sup>

#### Hospitals Excluded from PPS

As stated above, hospitals participating in approved demonstration projects, State reimbursement control programs, or regional demonstrations are excluded from the nationwide payment system. At the time that PPS was implemented, this category included hospitals in Maryland, Massachusetts, New Jersey, and New York. Beginning on October 1, 1985, hospitals in Massachusetts began to participate in the nationwide payment system, as of the beginning of each hospital's first fiscal year on or after that date.

---

<sup>8</sup> The completion of the transition to fully national PPS rates was delayed until the fifty-second day of each hospital's first cost reporting period beginning on or after October 1, 1987. In addition, beginning on April 1, 1988 and ending on September 30, 1990, for hospitals in regions with regional rates that are higher than the national rates, the PPS payment is to be a blend of 85 percent of the national rate and 15 percent of the regional rate.

Table 2.1a

TRANSITION TO NATIONAL PAYMENT RATES UNDER PPS  
HOSPITAL-SPECIFIC AND FEDERAL PORTIONS  
AS A PERCENTAGE OF TOTAL PPS RATE

<u>Cost Reporting Period Beginning On or After</u>	<u>Hospital-Specific Portion</u>	<u>Federal Portion</u>
October 1, 1983	75%	25%
October 1, 1984	50%	50%
October 1, 1985		
First 7 months:	50%	50%
Last 5 months:	45%	55%
October 1, 1986	25%	75%
October 1, 1987		
First 51 days:	25%	75%
Beginning on 52nd day:	0%	100%

Table 2.1b

TRANSITION TO NATIONAL PAYMENT RATES UNDER PPS  
REGIONAL AND NATIONAL PORTIONS  
AS A PERCENTAGE OF FEDERAL PPS RATE

<u>Discharges On or After</u>	<u>Regional Portion</u>	<u>National Portion</u>
October 1, 1983	100%	0%
October 1, 1984	75%	25%
October 1, 1986	50%	50%
November 21, 1987	0%	100% <sup>a</sup>

<sup>a</sup>Beginning on April 1, 1988 and continuing through September 30, 1990, hospitals in regions where the regional rate is higher than the national rate will be paid a blend of 85 percent of the national rate and 15 percent of the regional rate.

Hospitals in New York similarly began prospective payment on or after January 1, 1986. However, hospitals participating in two regional demonstrations within New York State--in the Rochester area (involving nine hospitals) and in the Finger Lakes area (involving seven hospitals)--continue to be excluded from prospective payment.

Psychiatric, rehabilitation, children's, and long-term care hospitals were also excluded from PPS, as are hospitals located outside the 50 States and the District of Columbia.<sup>9</sup> In addition, distinct-part psychiatric and rehabilitation units of acute care hospitals are excluded from PPS. These hospitals and units continue--for the time being--to be reimbursed by Medicare on a retrospective basis, subject to the TEFRA limits on the rate of increase in Medicare-reimbursable costs.<sup>10</sup>

A special limited-time exclusion was also provided for alcohol/drug treatment hospitals and units, while the system was refined to allow for their appropriate payment.<sup>11</sup>

#### Hospitals Given Special Consideration Under PPS

Hospitals that, by reason of factors such as isolated location, weather or travel conditions, or the absence of other hospitals, are the sole source of inpatient hospital services reasonably available to Medicare beneficiaries in a geographic area, may be designated as sole community hospitals. These

---

<sup>9</sup>Hospitals in Puerto Rico are included in PPS beginning in FY 1988.

<sup>10</sup>Recommendations on the issue of prospective payment for types of hospitals currently excluded from PPS are contained in a report that has been submitted to Congress by DHHS.

<sup>11</sup>This exclusion was scheduled to expire on September 30, 1985, but was extended to September 30, 1987. These hospitals and units are included in PPS beginning in FY 1988.

hospitals are to be paid indefinitely at a rate equal to 75 percent of the hospital-specific prospective payment rate plus 25 percent of the applicable regional prospective payment rate. During the PPS transition period, each such hospital also could receive an additional compensating payment if, due to circumstances beyond its control, it had experienced more than a 5 percent decrease in inpatient cases.

Other hospitals receiving special consideration under PPS include Christian Science sanatoria (which are paid an amount based on their historical operating costs per discharge), hospitals that are primarily devoted to cancer treatment and research (which were given the opportunity, during their first cost reporting period under PPS, to opt for reimbursement on a reasonable cost basis, subject to the TEFRA reimbursement limits), and regional referral centers (which are paid the applicable rates for urban hospitals in the same geographic region, except that the labor-related portion of the DRG rate is adjusted by the rural wage index<sup>12</sup> applicable to the hospital's location).

#### Determination of Prospective Payment Rates for FY 1986

##### Components of the Basic Prospective Payment Rates

The computation of the PPS rates during FY 1986 was based on a procedure consisting of the several components:

- o The calculation of the adjusted standardized amount, which represents the average operating cost for a typical Medicare inpatient stay, independent

---

<sup>12</sup>For a description of the role of the wage index in the determination of PPS payment rates, see the discussion below.



of the individual hospital's case mix, area wages, and other PPS payment factors and adjustments;

- o The calculation of the regional and national payment rates, which represent average operating costs for cases in each geographic region and nationwide, respectively; and
- o The calculation of the hospital-specific payment rate, which represents the hospital's own historical level of costs.

The PPS payment rate can then be obtained by blending the hospital-specific, regional, and national payment rates in the appropriate proportions. Using the example of the hospital with a cost reporting period beginning on January 1 (see Table 2.2), a case discharged on August 15, 1986 would have been paid at a rate equal to 45 percent of the hospital-specific rate plus 41.25 percent of the appropriate regional rate plus 13.75 percent of the national rate.

#### Additional Payment Amounts

In addition to the basic prospective payment rate per discharge, hospitals may receive other payments under PPS. These additional payments are made in recognition of the existence of certain conditions beyond the scope of PPS. They include payments for "outlier" cases, payments to cover indirect medical education costs, and payments to compensate hospitals that serve a "disproportionate share" of low-income patients.

Outliers are atypical cases that have exceptionally long inpatient stays or exceptionally high costs when compared to the overall distribution of cases in the same DRG. To qualify as a length of stay outlier during

Table 2.2

TRANSITION TO NATIONAL PAYMENT RATES UNDER PPS  
FOR HOSPITAL WITH COST REPORTING PERIOD BEGINNING JANUARY 1

<u>Time Period</u>	<u>Hospital-Specific Portion</u>	<u>Regional Portion</u>	<u>National Portion</u>
Oct. 1, 1983-Dec. 31, 1983	--not subject to prospective payment--		
Jan. 1, 1984-Sep. 30, 1984	75%	25.00%	0.00%
Oct. 1, 1984-Dec. 31, 1984	75%	18.75%	6.25%
Jan. 1, 1985-Jul. 31, 1986	50%	37.50%	12.50%
Aug. 1, 1986-Sep. 30, 1986	45%	41.25%	13.75%
Oct. 1, 1986-Dec. 31, 1986	45%	27.50%	27.50%
Jan. 1, 1987-Nov. 20, 1987	25%	37.50%	37.50%
Nov. 21, 1987-Feb. 20, 1988	25%	0.00%	75.00%
Feb. 21, 1988 onward	0%	0.00%	100.00%

FY 1986, the patient's stay (excluding days that are not covered under HI) was required to have exceeded the geometric mean length of stay for the DRG by the lesser of 17 days or 1.94 standard deviations. For each day in excess of the length of stay outlier threshold, the additional outlier payment amount is equal to 60 percent of the average PPS standard per diem cost for the applicable DRG, which is calculated by dividing the Federal portion of the payment rate for the DRG by the corresponding geometric mean length of stay.

To qualify as cost outliers, cases must not meet the criteria for length of stay outliers. In addition, for FY 1986, the hospital's charges for covered services, adjusted to cost,<sup>13</sup> were required to have exceeded the greater of \$13,500 (adjusted for each hospital's wage index) or twice the Federal rate for the DRG. The additional payment amount for cost outliers is equal to 60 percent of the difference between the hospital's adjusted cost for the case and the cost outlier threshold. As is the case for length of stay outliers, this additional payment amount is applied only to the Federal portion of the PPS payment rate.

In recognition of the tendency for teaching hospitals to treat extraordinary cases and of the extra costs involved in providing treatment within the context of graduate medical education, each hospital with an approved graduate medical education program receives an additional payment to cover indirect medical education costs. The amount of this additional payment is based on the hospital's proportion of full-time equivalent interns and residents per bed. For discharges on or before April 30, 1986, the

---

<sup>13</sup> Hospital charges were adjusted to costs for the purpose of comparison to the cost outlier criteria in FY 1986 by multiplying total Medicare covered charges for the case by 0.72, an estimate of the average nationwide ratio of hospital costs to charges, and dividing by the hospital's indirect medical education and disproportionate share adjustment factors (see the discussion of these factors below).

hospital received an additional payment equal to 11.59 percent of the Federal portion of the Medicare payment rate for each case, including any outlier payments, for every increment of 0.1 in this ratio. For discharges on or after May 1, 1986, the indirect medical education adjustment factor was reduced to approximately 8.1 percent.<sup>14</sup>

To take into account the special needs of hospitals that serve a significantly disproportionate share of low-income patients, discharges at these hospitals on or after May 1, 1986 receive an additional payment under PPS. Hospitals qualify for this additional payment if they meet a set of criteria based on their "disproportionate patient percentage" (DPP), which is defined as the sum of the proportion of Medicare Part A patient days accounted for by patients entitled to Supplemental Security Income (excluding those receiving State supplementation only) and the proportion of total patient days accounted for by patients entitled to Medicaid (but not Medicare Part A). A hospital qualified in FY 1986 if:

- o It was located in an urban area and had 100 or more beds, with a DPP of at least 15 percent; or
- o It was located in an urban area and had fewer than 100 beds, with a DPP of at least 40 percent; or
- o It was located in a rural area, with a DPP of at least 45 percent.

For urban hospitals with 100 or more beds, if more than 30 percent of its total inpatient care revenues were derived from State and local government payments for indigent care furnished to patients not covered by Medicare or

---

<sup>14</sup>For discharges on or after May 1, 1986, the formula for calculating indirect medical education payments was also changed from a linear to a non-linear function of interns and residents per bed, to take account of the non-linear relationship between cost per case and teaching intensity.

Medicaid, it also qualified for disproportionate share payments during FY 1986.

The amount of the disproportionate share payment was calculated as follows:

- o For urban hospitals with 100 or more beds, the hospital's total PPS payment was increased by 2.5 percent plus one-half the difference between the hospital's DPP and 15 percent, up to a maximum of 15 percent;
- o For urban hospitals with fewer than 100 beds, the hospital's total PPS payment was increased by 5 percent; and
- o For rural hospitals, the hospital's total PPS payment was increased by 4 percent.

For the purpose of this calculation, total PPS payments included outlier payments but excluded indirect medical education payments.

#### Calculation of the Payment Amount

As stated above, the calculation of the PPS payment rates during the 4-year transition period involved the calculation of three component rates: the hospital-specific rate and the regional and national rates.

To obtain the hospital-specific payment rate for each case treated at a given hospital, the following steps were required:

- o First, the hospital's base year cost per Medicare case was computed from data on audited Medicare cost reports for cost reporting periods ending between September 30, 1982 and September 29, 1983.

- o Next, this base year cost per case figure was adjusted for the hospital's case mix by dividing by the hospital's 1981 case mix index.
- o Then, the case mix-adjusted base year cost per case was updated, using actuarial estimates of the rate of increase in hospital operating costs nationwide between 1981 and FY 1983, the estimated annual rate of increase in HCFA's hospital market basket, plus one percentage point, from FY 1983 through FY 1984, and the estimated annual rate of increase in the hospital market basket, plus 0.25 percentage points, from FY 1984 through FY 1985. For discharges occurring in FY 1986, but on or before April 30, 1986, the FY 1985 figure was used; for discharges occurring on or after May 1, 1986, an update factor of 0.5 percent was applied.

The resulting figure was then multiplied by the appropriate DRG relative weight.

The regional and national payment rates were based on the calculation of an adjusted standardized amount, which, in turn, was accomplished in six steps:

- o The cost per Medicare case was first computed for each hospital from data on the hospital's unaudited Medicare cost report for the cost reporting period ending during 1981.
- o These cost per case figures were then updated to FY 1984, as described in the above discussion of the hospital-specific rate.
- o The updated cost per case figures by hospital were then standardized for inter-hospital variation in case mix and indirect medical education costs. This was done by first dividing by the hospital's 1981 case mix

index and then dividing by the indirect medical education adjustment described above.<sup>15</sup>

- o The results of the previous calculation were then standardized for differences in area wage levels and, for hospitals in Alaska and Hawaii, for general differences in the cost of living. This was done by dividing the "labor-related portion" of the hospital's cost per case (defined as 79.15 percent of the total cost per case) by the appropriate area wage index, and by dividing the "nonlabor-related portion" of the hospital's cost per case (defined as 20.85 percent of the total cost per case) by an index of the cost of living for Alaska and Hawaii.
- o The resulting standardized cost figures were grouped for urban and rural hospitals in each census region and nationwide.
- o The standardized regional and national average cost figures were then reduced by 5 percent, to account for additional payments to hospitals for outlier cases (which were projected at five percent of total FPS payments for FY 1986).
- o The adjusted standardized regional and national figures were then updated to FY 1986, using the procedure described in the above discussion of the hospital-specific rate.

The resulting amounts were the basis for the calculation of the regional and national rates.

To obtain the regional and national payment rates for each case treated at each hospital, the appropriate regional and national adjusted standardized

---

<sup>15</sup> The adjustment for indirect medical education used to compute the standardized payment amount did not reflect the changes that took effect on May 1, 1986. Similarly, no adjustment was made for disproportionate share payments in the computation of the FY 1986 standardized payment amount.

amounts were divided into their labor-related and nonlabor-related portions (79.15 and 20.85 percent, respectively, of the total amounts). The labor-related portion was then multiplied by the appropriate area wage index, and the nonlabor-related portion by the appropriate cost of living index for hospitals in Alaska and Hawaii. The labor-related and nonlabor-related portions were added back together, and the resulting figures multiplied by the appropriate DRG relative weight (which reflects the nationwide relative cost of treating cases in that DRG).

The PFS payment rate could then be obtained by blending the hospital-specific, regional, and national payment rates in the appropriate proportions, as described above.

#### The PFS Incentive Structure

The system by which payments for hospital services are determined provides powerful behavioral incentives--both positive and negative--that can affect all parties involved in the health care system. Historically, the hospital industry has been the primary target of these incentives. Since the hospital has traditionally been the central locus of the health care delivery system, and since hospital services account for a majority of health care costs, the containment of hospital costs has been the focus of many cost-cutting initiatives.

Under PFS, this historical focus on hospitals has continued. As stated by the designers of the system (U.S. Department of Health and Human Services, 1982, p. 101): "When hospitals are paid in a different way, it is reasonable to expect that their behavior will change. Indeed, changing hospital behavior is the purpose of this initiative [PFS]." However, rather than



directly regulating the level of hospital costs or specifying the actions to be taken to reduce these costs, prospective payment is designed to alter the incentive structure with which hospitals are faced and to allow hospitals to determine their specific responses to these incentives.

While hospital behavior is the primary target of PPS incentive structure, it is important to recognize that the new system is also likely to affect other groups--such as Medicare beneficiaries, other payers for inpatient hospital services, and other providers of health care--in significant ways. Consequently, it can be expected that the individuals and institutions in each of these groups will respond with a range of both immediate and longer-term adjustments to their behavior.

The remainder of this chapter is devoted to a brief discussion of some of the incentives that are built into PPS and some of the behavioral responses that might reasonably be expected. The discussion of these expected responses is intended to provide a context for the findings presented in the following chapters.

### Hospitals

Prior to PPS, hospitals were reimbursed for all reasonable costs incurred in the provision of inpatient care to Medicare patients. Since an increase in the cost of treatment imposed no financial penalty on the hospital, and since it realized no financial benefit from reducing the cost of treatment, the incentive was to maximize the quantity of care provided. By offering more intensive and more technologically advanced (and, therefore, usually more expensive) services, the hospital could enhance its standing in the medical care community at essentially no net cost.

Under PFS, hospitals can no longer afford to make decisions about the quantity of care without considering the cost-effectiveness of that care. The hospital stands to suffer financially if the cost of the case exceeds the fixed prospective payment amount; moreover, the hospital can realize all of the financial benefits of any reduction in the cost of the case. Thus, the various objectives of the hospital may begin to conflict with one another. On the one hand, for instance, the desire to generate net revenues--for distribution as profits to stockholders or to provide funds for capital investment--may preclude desired increases in the intensity of care or the acquisition of the latest developments in medical technology; on the other, however, the hospital may find that the competitive advantages provided by very intensive care or the availability of state-of-the-art technology outweigh their costs.

One of the changes expected under PFS is in the area of hospital administration. With the efficient provision of care becoming necessary to the financial viability of the hospital, the decisions made by the hospital administrator become increasingly important. An expansion of the size and sophistication of the administrative staff seems likely, as the importance of its role increases. In addition, PFS is expected to serve as an impetus for the development of new data bases that can be used as administrative planning tools, for controlling both the quantity of services provided and the cost of producing those services. Since the medical record has essentially become the hospital bill under PFS, the medical records staff has become more important to the hospital, and can be expected to increase in size and proficiency. With the linkage of diagnostic and financial data, it will become easier for the hospital to examine its own practice patterns, analyze its expenditures, and better determine how to provide care to its patients in a more efficient manner.

On the other hand, hospitals may be encouraged to place an increasing emphasis on pecuniary results under PPS. This may result in a growing tendency by hospital management to interfere in what were previously viewed as primarily medical decisions. This conflict between the incentive to cut costs and the desire to provide access to high-quality care for all patients was recognized at the outset of PPS. In response to this potential conflict, the PRO program described above was established to monitor the necessity, appropriateness, and quality of care provided by hospitals.

PPS is also expected to affect hospital organization and structure. For example, the recent trend toward the consolidation of hospitals into chains and other forms of multi-institutional systems (horizontal integration) appears likely to continue or accelerate, as hospitals attempt to increase their service volume and purchasing power and to reduce administrative overhead. In addition, hospitals are likely to diversify their services (vertical integration), by forming, acquiring, or contracting with home health agencies (HHAs), SNFs, free-standing outpatient clinics, etc., because the ability to provide such services may provide a competitive edge. In the long run, then, it seems likely that the hospital industry will become both more horizontally and more vertically integrated, and that this trend will change the nature of health care delivery.

The admission and discharge practices of the hospital are also likely to be affected by PPS. Since the admission is the unit of payment, one of the most widely anticipated impacts of PPS was that hospitals might attempt to increase their revenues by increasing the volume of admissions. To counter this potential effect, Medicare admissions have been closely monitored by

DHHS.<sup>16</sup> In addition, the PROs are responsible for reviewing the necessity and appropriateness of admissions under PPS.

Another widely anticipated impact of PPS is a decrease in the length of hospital stays. Since the hospital receives a fixed payment for each inpatient stay, each additional day of that stay represents a financial loss. This should result in fewer unnecessary hospital days for Medicare patients, and may reduce the incidence of illnesses acquired in the hospital. In order to safeguard against inappropriate discharges in response to this incentive, the PROs are empowered to deny payment for cases in which a readmission results from a premature discharge and to recommend to the Office of the Inspector General that hospitals evidencing patterns of inappropriate care be sanctioned (i.e., by recovery of a financial penalty or exclusion from the program).

The Medicare program has been joined by other payers for health care in attempting to shift the emphasis in health care delivery from the hospital to other more appropriate and less expensive settings. Thus, the coordination of various levels of care--ambulatory, acute, and sub-acute care--is expected to improve under PPS. An increase in discharges from hospitals to other types of health care facilities and services is expected.

There is also concern that PPS may provide an incentive to avoid certain types of patients that are viewed as unprofitable ("skimming") or to inappropriately transfer these patients once they have been admitted ("dumping"). In anticipation of this type of behavior, the PROs are also mandated to review the appropriateness of transfers under PPS.

---

<sup>16</sup> The expected increase in Medicare admissions has not, in fact, been observed. To the contrary, for the first time in the history of the Medicare program, admissions have declined. See Chapter 3 for a more detailed discussion of this issue.

PFS is also expected to affect the intensity of care. With the incentive to reduce the cost of care, the number of laboratory tests, x-rays, etc. performed in the hospital may be reduced. Depending on the way in which this reduction is accomplished, it may have positive or negative results: if there is a reduction in unnecessary ancillary services, the quality of care may improve; however, to the extent that necessary services are cut, there may be an adverse effect on the quality of care. Even if the volume of ancillary services per stay is reduced, the intensity of care may increase, due to the decreased length of each stay. Moreover, much of the observed reduction in inpatient tests and other services may be offset by an increase in pre- and post-admission services provided in the outpatient setting.

Under PFS, the mix of inputs used by hospitals and also their mix of outputs may change. Staffing levels and the mix of skills required of hospital personnel may become quite different from what they are today, as hospitals adjust to their changing role in the health care sector. Basic changes may be observed in the types of services that each hospital provides, as many hospitals find that they can no longer afford to offer the complete range of inpatient services to their patients, and instead choose to specialize in those services that they can provide proficiently and efficiently. Greater cooperation among hospitals and between hospitals and other providers of health care--through both formal and informal referral arrangements--may be observed.

For the time being, capital costs are reimbursed on a "pass-through" basis (see the discussion earlier in this chapter). At first glance, it may appear that hospitals would have an incentive to increase their capital expenditures under this arrangement. However, capital expenditures create operating expenses that are subject to prospective payment. Thus, the

incentive to increase capital expenditures may be limited under PFS. In addition, the Congress has expressed the desire to eventually include capital expenses under PFS. Once this is accomplished, PFS incentive for cost efficiency will apply directly to almost all of the costs associated with inpatient hospital care.

The purchase of technology is expected to receive increased scrutiny under prospective payment. PFS provides strong incentives for hospitals to implement technologies that are cost-reducing, while avoiding those that are cost-increasing. Thus, hospitals are likely to become more prudent buyers of new technology under PFS. This may involve strategies such as the sharing of expensive technologies among hospitals, and a general increase in the efficiency with which this equipment is purchased and utilized. Care must be taken, however, that the acquisition of new technology be evaluated on its long-run as well as its short-run cost effectiveness, so that potentially beneficial research and development is not discouraged. Under a "best case" scenario, the medical device industry would mirror the computer industry, where innovation has led to less expensive and vastly more productive equipment.

PFS may also have some overall supply effects. Although the fixed payment provided under PFS is intended to increase hospital efficiency, some hospitals may experience financial problems under the new payment system. Several features, such as the special treatment of sole community providers, the indirect medical education payment, the disproportionate share payment, the adjustment for area wages, and the outlier payment policy, have been added to the system to adjust for cost differences that may not conclusively be attributed to inefficiency. In addition, other improvements to the system are continually being developed and examined.

## Beneficiaries

The primary criterion by which the performance of any social program must be judged is its ability to efficiently provide the intended benefits to the intended beneficiary group. The Medicare program was enacted to enable the elderly (and later certain other groups) to acquire adequate medical care without economic hardship. The incentives provided by PPS must then be carefully evaluated in terms of their ultimate impact along three dimensions: the quality of care, access to care, and out-of-pocket costs.

The quality of care is a most important concern under prospective payment. To the extent that hospitals might be encouraged to reduce the provision of necessary services in order to minimize costs or to discharge patients prematurely, the quality of care might be adversely affected. However, many of the incentives that have traditionally served to maintain the quality of care in the past still remain. Physicians, who provide and direct much of the care provided to hospital patients, have long had established codes of professional ethics, and both physicians and hospitals are subject to malpractice litigation if lower quality is reflected in negative treatment outcomes. In addition, as stated above, the PROs are required to monitor the necessity, appropriateness, and quality of care.

Furthermore, to the extent that prospective payment leads to a reduction in unnecessary care, the quality of care could be enhanced. Increased emphasis on the efficient provision of care could improve the efficacy of that care, as well. Also, a reduction in the length of hospital stays could reduce the risk of nosocomial infections and other hospital-related illness. Moreover, the incentive for hospitals to specialize in services that can be most efficiently and effectively provided may lead to improved outcomes. The

quality of care under FPS will continue to be a focus of both short-run and long-run monitoring efforts by DHHS.

Medicare beneficiaries' continued access to care is also a major concern under FPS. The expected tendency of hospitals to specialize in certain services may affect access to the services that these hospitals choose not to provide. Also, since prospective payment could lead hospitals to avoid admitting patients that are seen as representing greater risk of financial loss, such as the oldest elderly or patients with ESRD, the availability of care becomes an especially important issue for those groups.

Although some of the incentives of FPS may lead to hospital behavior that can reduce access to health care, there are still many factors that serve to counteract these incentives. The special treatment of sole community hospitals and regional referral centers was intended to protect areas that might be threatened with access problems. The codes of professional ethics subscribed to by health care providers require them to provide appropriate care to all who are in need of care. The threat of malpractice suits is an additional deterrent from selective admissions policies. DHHS will continue to monitor this issue.

Another concern relevant to the impact of FPS on Medicare beneficiaries is their out-of-pocket costs. A large portion of the medical bill for the elderly and other Medicare beneficiaries is not covered by Medicare. Since FPS incentives may affect both the volume of medical care and the setting of that care, the new system may have a substantial impact on the out-of-pocket costs borne by beneficiaries. In particular, the deductible (and also the copayment) amount for Medicare hospital stays rose rapidly in the early years of FPS, prompting congressional action to limit these amounts beginning in 1987. Also, the shift in treatment from the inpatient to the outpatient



setting, where the patient is responsible for a copayment from the beginning of service, may increase the cost of care for the beneficiary. The increased utilization of sub-acute post-hospital care anticipated under PFS may also affect the financial burden on the Medicare beneficiary, if Medicare does not adequately cover the entire continuum of care.

On the other hand, a decrease in the length of hospital stays may reduce the number of beneficiaries who exhaust their Medicare hospital coverage, thus helping to avoid a substantial financial liability. Also, to the extent that the shift from inpatient to outpatient care helps beneficiaries avoid the inpatient deductible amount associated with each episode of inpatient care, their overall out-of-pocket costs may decrease.

#### Other Payers

The impact of PFS on other payers for inpatient hospital services was expected to be felt on two levels: the potential for cost-shifting and the role of PFS as an example for the cost-containment efforts of other payers.

With the implementation of PFS, it was thought that hospitals, faced with fixed prospective payment for Medicare cases, might be encouraged to engage in cost-shifting between Medicare and other payers. Thus, other payers would be forced to pay an increased share of the total costs of the hospital to compensate for the cost-containment pressures imposed by the Medicare program. However, the increasing trend toward the implementation by other third-party payers of their own cost-containment strategies (see Chapter 6) makes it unlikely that hospitals can shift costs between payers with impunity.

PFS has served as an example for other payers in two ways. First, PFS demonstrated that the Federal Government was willing to take dramatic action to curtail the growth of health care costs. Second, the payment of hospital costs on a prospective basis, with the discharge defined as the unit of output and patients classified according to the DRG framework, provided a model for other payers to use in developing their own payment systems. Over time, it is expected that many other third-party payers--especially among the State Medicaid programs--will adopt at least some features of the Federal system.

#### Other Providers

PFS can be expected to have a profound effect on other providers, as well. The two groups expected to be most directly affected are physicians and the providers of sub-acute post-hospital care (aftercare).

Several aspects of the behavior of physicians are likely to be affected by PFS. Hospital administrators may use various forms of persuasion to induce physicians to reduce the lengths of their patients' hospital stays, to decrease the number of tests and x-rays performed on an inpatient basis, and to otherwise contain the cost of treatment. As the administrative pressures on physicians in the hospital increase, as the decreasing length of hospital stays reduces the income available to physicians in the hospital setting, and as the growing supply of physicians makes admitting privileges more difficult to obtain, physicians may respond by shifting many services to ambulatory settings, such as the outpatient department or their own offices.

Aftercare providers (primarily SNFs, intermediate care facilities (ICFs), and HHAs) are most likely to be affected by the tendency toward earlier

discharges anticipated under PPS. This tendency is expected to result in an increase in both the number of patients seeking aftercare and the severity of illness among these patients, necessitating an increase in the capacity of these providers and the level of skills required of their staffs. Some of the pressure on the aftercare industry may be relieved by the formation of hospital-based units and services, as described above. In any case, however, the changing role of the hospital in the delivery of health care and, in particular, the emphasis on the concept of a continuum of care provided by a continuum of health care providers, is expected to cause a substantial change in this industry.

### Discussion

Clearly, PPS represents an important change in the way that health care is paid for and, correspondingly, in the incentives facing the major groups of individuals and institutions in the health care sector. This chapter has briefly reviewed the developments leading up to this change, and has described the major features of the PPS. In the discussion of PPS's incentive structure and the behavioral changes that are anticipated in response to these incentives, a context is provided for research on the impact of the new system. The remaining chapters in this report describe the current status of this research, its findings, and the implications of these findings.

## REFERENCES FOR CHAPTER 2

Coelen, C.G. and Yaffee, R. "The National Hospital Rate-Setting Study: Summary of Current Findings on the Effects of Hospital Prospective Payment Systems." Unpublished working paper. Washington, D.C.: Health Care Financing Administration, 1984.

U.S. Department of Health and Human Services. Hospital Prospective Payment for Medicare. Washington, D.C.: 1982.

## Chapter 3

### IMPACT ON HOSPITALS

#### Introduction

##### Overview

The primary objective of Medicare's prospective payment system (PPS) was to change the economic incentives facing hospitals under the Medicare program. By putting hospitals at risk for costs that are higher than the prospectively set rates for each type of patient and allowing them to benefit from cost reductions below the prospective rates, PPS was intended to encourage improved efficiency in the production of hospital services. The hope was that this would moderate the increase in Medicare hospital costs while, at the same time, maintaining the quality of care provided to Medicare beneficiaries and their access to the care they need.

Although it was both recognized and intended that other health care providers and other payers for health care would also be influenced by the new payment system, only hospital incentives were directly affected. It is appropriate, therefore, to begin the presentation of findings in this report with the impact of PPS on the nation's hospitals.

It is important to recognize at the outset that the impact of PPS is difficult to isolate, given the large number of concurrent changes that have taken place in the health care sector over the past several years. In response to the rapid increase in health care costs during the 1970s and early 1980s, both public and private third-party payers have shown a growing interest in strategies intended to control the cost of health care.

Some of these are described in Chapter 6; in the context of this chapter, it is only necessary to note that they complicate any attempt to attribute the changes that may be observed to any single public or private initiative.

### Data Sources

The major sources of data used in this chapter are the Health Care Financing Administration's (HCFA's) Medicare Statistical System and the American Hospital Association's (AHA's) Monthly Panel Survey and Annual Survey of Hospitals. In general, the discussion of empirical evidence focuses first on Medicare trends, since the Medicare program itself was the intended subject of PFS effects. The AHA data are used to describe the effects on the nation's hospitals as a whole, as well as to compare Medicare and non-Medicare trends. Findings from several more detailed analyses of both HCFA and AHA data are also reported in this chapter. A series of case studies conducted under contract with HCFA by Abt Associates, Inc., and Health Economics Research, Inc., although not intended to yield nationally representative data, provide a contextual basis for much of the discussion in this chapter.

### Chapter Organization

This chapter is organized under several topic headings that describe various aspects of hospital behavior expected to be affected by Medicare PFS, as well as the environment in which that behavior takes place:

- o Utilization;
- o Intensity of Care;
- o Financial Status;
- o Hospital Management and Cost Control; and
- o Hospital Investment and Service Adoption.

In the section on hospital utilization, trends in admissions, length of stay, and occupancy rates over time and across hospital groups are discussed. The section on intensity of care focuses on trends in the type of care provided, as indicated by the Medicare case mix index, surgical admissions, and the utilization of special care units. Since PPS incentives are essentially economic incentives, the impact on hospital financial status--and on payments and costs, the components of financial status--is a crucial aspect of the evaluation of PPS. The section on hospital management and cost control contains observations on changes in the way that hospitals are managed in the new health care environment, derived mostly from the PPS case studies. Evidence on hospital investment trends prior to and immediately after the implementation of PPS is then presented.

### Utilization

#### Admissions

From 1967, the first full year of the Medicare program, through 1983, Medicare admissions increased in every year (see Table 3.1). For the 13-year period from 1971 through 1983, the annual increase was never less than 3 percent. With the advent of prospective payment in October 1983, however,

Table 3.1

**TRENDS IN MEDICARE SHORT-STAY HOSPITAL ADMISSIONS**  
**CALENDAR YEARS 1967-84 AND FISCAL YEARS 1982-86**

<u>Calendar Year</u>	<u>Admissions (thousands)</u>	<u>Percent Change</u>	<u>HI Enrollees (thousands)</u>	<u>Admissions per Thousand HI Enrollees</u>	<u>Percent Change</u>
1967	5,344	---	19,082	274	---
1968	5,927	+10.9	19,494	300	+ 9.4
1969	5,951	+ 0.4	19,770	297	- 0.8
1970	6,045	+ 1.6	20,014	297	- 0.2
1971	6,227	+ 3.0	20,361	300	+ 1.1
1972	6,521	+ 4.7	20,742	309	+ 2.9
1973	7,079 <sup>a</sup>	+ 8.6	21,115	305	- 1.2
1974	7,755	+ 9.5	23,201	324	+ 6.2
1975	8,126	+ 4.8	23,924	330	+ 1.7
1976	8,625	+ 6.1	24,640	341	+ 3.3
1977	9,067	+ 5.1	25,313	347	+ 2.0
1978	9,423	+ 3.9	26,094	352	+ 1.3
1979	9,790	+ 3.9	26,777	357	+ 1.3
1980	10,435 <sup>b</sup>	+ 6.6	27,459	372	+ 4.3
1981	10,858 <sup>b</sup>	+ 4.1	28,067	380	+ 2.2
1982	11,337	+ 4.4	28,590	390	+ 2.7
1983	11,719	+ 3.4	29,069	396	+ 1.6
1984	11,431 <sup>c</sup>	- 2.5	29,996	381	- 3.8

<u>Fiscal Year</u>	<u>Admissions (thousands)</u>	<u>Percent Change</u>	<u>HI Enrollees (thousands)</u>	<u>Admissions per Thousand HI Enrollees</u>	<u>Percent Change</u>
1982	11,218	---	28,949	388	---
1983	11,702	+ 4.3	29,458	397	+ 2.5
1984	11,533 <sup>c</sup>	- 1.4	29,894	386	- 2.9
1985	10,846	- 6.0	30,441	356	- 7.6
1986	10,380	- 4.3	31,078	334	- 6.3

<sup>a</sup> Admission and enrollee counts include disabled beneficiaries beginning in July 1973.

<sup>b</sup> Partially estimated due to missing data.

<sup>c</sup> Admission counts beginning in October 1983 do not include admissions to beds in excluded psychiatric, rehabilitation, and alcohol/drug units within short-stay hospitals, or admissions to rehabilitation and pediatric hospitals that had short-stay hospital provider numbers prior to FFS. These account for less than one percent of Medicare admissions.

NOTE: Data in this table are based on bills processed by HCFA through December 1986, and are thus preliminary and subject to revision.

Source: Health Care Financing Administration, Bureau of Data Management and Strategy.



Medicare admissions declined--despite the fact that, in paying on a per case basis, PPS would seem to encourage hospitals to increase the number of Medicare admissions.

Medicare admissions decreased by 4.3 percent in FY 1986. While this was somewhat smaller than the 5.3 percent decrease in FY 1985, the trend toward fewer Medicare admissions under prospective payment appears to have continued. By FY 1986, the number of Medicare admissions had declined by 11.3 percent from its peak in FY 1983--even though the number of Medicare enrollees had increased by 5.5 percent (from 29.5 million to 31.1 million). Thus, the number of admissions per thousand Medicare enrollees fell by almost 16 percent (from 397 to 334) over the first 3 years of prospective payment. It should be noted that some of the files on which these data are based are not yet complete, so they may somewhat understate the number of admissions in the most recent years; even so, the implications are clear--Medicare admissions have declined sharply since the implementation of PPS.

Whether this decline is due to PPS, however, is less clear. Table 3.2 describes recent trends in inpatient hospital utilization for all patients, both Medicare and non-Medicare. Overall hospital admissions have been declining, even though the U.S. population has been increasing at an estimated annual rate of about 1 percent since 1983 (Social Security Administration, 1987). The decline in inpatient utilization began before PPS was implemented, accelerated in 1984 and 1985, and appeared to be continuing at a somewhat slower rate in 1986.

The number of inpatient days also has declined--more rapidly than admissions between 1982 and 1985, reflecting a decrease in average length of stay (see below), but more slowly than admissions in 1986. By 1986, patients spent 15.7 percent fewer days in short-term community hospitals than they did in 1983.

Table 3.2

TRENDS IN INPATIENT HOSPITAL UTILIZATION AND CAPACITY  
CALENDAR YEARS 1979-86

<u>Year</u>	<u>Admissions</u>		<u>Inpatient Days</u>		<u>Staffed Beds</u>		<u>Occupancy Rate</u>	
	<u>Number (000s)</u>	<u>Pct. Change</u>	<u>Number (000s)</u>	<u>Pct. Change</u>	<u>Number (000s)</u>	<u>Pct. Change</u>	<u>Rate</u>	<u>Pct. Change</u>
1979	36,508	---	260,792	---	959	---	74.5%	---
1980	37,562	+2.9	269,615	+3.4	970	+1.2	75.9	+1.9
1981	37,882	+0.9	272,957	+1.2	987	+1.7	75.8	-0.1
1982	37,899	+0.0	271,422	-0.6	998	+1.1	74.5	-1.7
1983	37,692	-0.5	264,504	-2.5	1,004	+0.6	72.2	-3.1
1984	36,305	-3.7	241,780	-8.6	993	-1.1	66.6	-7.8
1985	34,535	-4.9	226,129	-6.5	975	-1.8	63.6	-4.5
1986	33,810	-2.1	222,963	-1.4	963	-1.2	63.4	-0.3

Source: AHA (1979-1986).

The number of staffed beds reached a peak of slightly over one million in 1983, and then began to decline--presumably in response to the decrease in inpatient days. By 1986, there were 4.1 percent fewer staffed beds in the nation's hospitals than there were in 1983. The decrease in the number of staffed beds was not as steep as that in the number of inpatient days, however, resulting in a continuing decline in the occupancy rate. The occupancy rate declined from 75.9 percent in 1980 to 63.4 percent in 1986.

The decline in admissions has not been evenly distributed across hospital groups, however (see Table 3.3). The overall decline between 1983 and 1985 was 8.4 percent. However, hospitals in the Middle Atlantic region experienced only a 3.3 percent decline, while hospitals in the West North Central and West South Central regions experienced declines of 13.0 and 12.6 percent, respectively. The decline in admissions also appears to be strongly related to hospital size, with the smallest hospitals experiencing the greatest decline: hospitals with under 50 beds experienced a 22.3 percent decline in admissions and hospitals with 50 to 99 beds a 17.1 percent decline, while hospitals with 500 or more beds experienced only a 2.7 percent decline.

As has been previously noted, the decline in admissions under FFS has been a major surprise. Several factors have been suggested to explain this unexpected observation, including advances in health care technology that allow more services to be provided on an outpatient basis, increased competition among health care providers that results in the availability of more ambulatory services, and admission review by both Medicare's Utilization and Quality Control Peer Review Organizations (PROs) and other third-party payers.

Table 3.3

CHANGE IN COMMUNITY HOSPITAL ADMISSIONS BY HOSPITAL TYPE  
CALENDAR YEARS 1983-85

<u>Hospital Type</u>	<u>Year</u>		<u>Percent Change</u>
	<u>1983</u>	<u>1985</u>	
U.S. Total	37,691,924	34,535,125	- 8.4
By Region:			
New England	1,837,050	1,746,766	- 4.9
Middle Atlantic	5,882,459	5,687,513	- 3.3
South Atlantic	6,259,869	5,683,504	- 9.2
East North Central	6,878,679	6,186,700	-10.1
East South Central	2,895,947	2,685,741	- 7.3
West North Central	3,194,660	2,778,008	-13.0
West South Central	4,421,852	3,866,716	-12.6
Mountain	1,792,248	1,633,686	- 8.8
Pacific	4,529,160	4,266,491	- 5.8
By Size:			
<50 Beds	1,310,467	1,031,563	-22.3
50-99 Beds	3,791,475	3,142,041	-17.1
100-199 Beds	7,853,195	6,959,199	-11.4
200-299 Beds	6,957,818	6,371,676	- 8.4
300-399 Beds	5,537,062	5,253,878	- 5.1
400-499 Beds	4,366,450	4,112,227	- 5.8
≥500 Beds	7,875,457	7,664,541	- 2.7

Source: AHA (1983, 1985).

Whatever the causes of the decline in admissions, it is not restricted to Medicare patients. Figure 3.1 displays the year-to-year change in hospital admissions for patients who are aged 65 and older--almost all of whom are Medicare beneficiaries--and for patients who are younger than 65--very few of whom are Medicare beneficiaries. Admissions for the under 65 age group began to decline before admissions for the 65 and older group, and the decline has generally been steeper for the younger group. As a result, patients who are aged 65 and older have accounted for a steadily increasing proportion of total hospital admissions. In 1979, these patients accounted for 37 percent of all admissions; by 1986 the proportion had grown to almost 47 percent (AHA, 1979 and 1986).

#### Average Length of Stay

The average length of stay for all Medicare beneficiaries in short-stay hospitals has been decreasing steadily since the Medicare program began (see Table 3.4). Between 1967, the first full year of Medicare, and FY 1983, the last year before the implementation of PPS, Medicare length of stay decreased at an annual rate of 2 percent. Since the implementation of PPS, however, the decrease in length of stay has been more rapid.

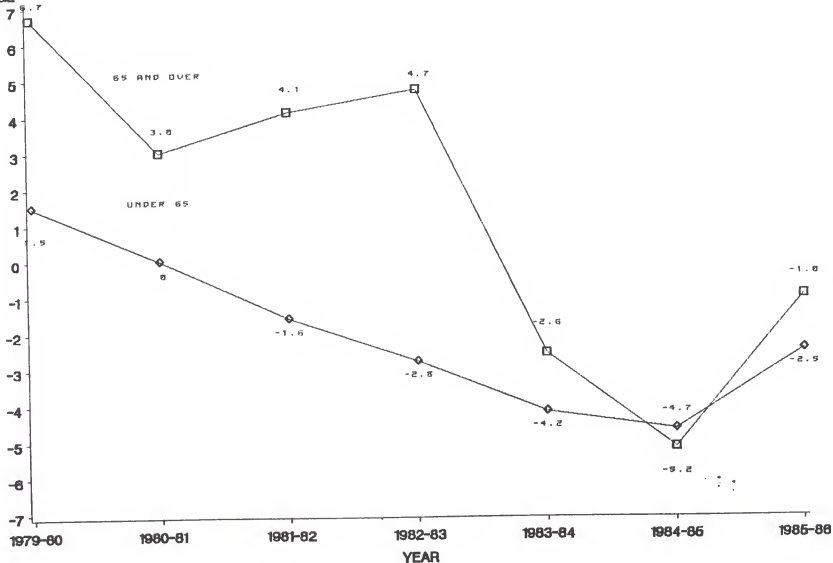
In FY 1984--the first year of PPS--overall Medicare length of stay (including both PPS and non-PPS discharges) fell by 9 percent--a decrease four and one-half times as steep as the pre-PPS average, and more than twice as steep as the decrease in any previous year. In the second and third years of PPS, the rate of decrease in overall Medicare length of stay continued to be greater than in any year since 1971.

# FIGURE 3.1

## CHANGES IN HOSPITAL ADMISSIONS BY AGE GROUP

### 1979-86

PERCENT CHANGE



SOURCE: AMERICAN HOSPITAL ASSOCIATION.  
NATIONAL HOSPITAL PANEL SURVEY REPORT.  
DECEMBER 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986

Table 3.4

AVERAGE LENGTH OF STAY FOR MEDICARE BENEFICIARIES  
IN SHORT-STAY HOSPITALS (WAIVER AND NON-WAIVER STATES)  
CALENDAR YEARS 1967-81 AND FISCAL YEARS 1981-86

<u>Calendar Year</u>	<u>Average Length of Stay<sup>a</sup></u>	<u>Percent Change</u>
CY 1967	13.8	---
CY 1968	13.8	0.0
CY 1969	13.5	-2.2
CY 1970	13.0	-3.8
CY 1971	12.5	-3.9
CY 1972	12.1	-3.2
CY 1973	11.7	-3.3
CY 1974	11.5	-1.7
CY 1975	11.2	-2.6
CY 1976	11.1	-0.9
CY 1977	11.0	-0.9
CY 1978	10.8	-1.8
CY 1979	10.7	-0.9
CY 1980	10.6	-0.9
CY 1981	10.5	-0.9
<u>Fiscal Year</u>	<u>Average Length of Stay</u>	<u>Percent Change</u>
FY 1981	10.5	---
FY 1982	10.3	-1.9
FY 1983	10.0	-2.9
FY 1984	9.1	-9.0
FY 1985	8.6	-5.5
FY 1986	8.3	-3.5

<sup>a</sup>Data for CY 1967-81 include aged beneficiaries only. The omission of other beneficiaries may result in an overstatement of approximately 0.1 days in annual average length of stay for the years CY 1973-81.

NOTE: Data in this table are based on bills processed by HCFA through December 1986, and are thus preliminary and subject to revision.

Source: Health Care Financing Administration, Bureau of Data Management and Strategy.

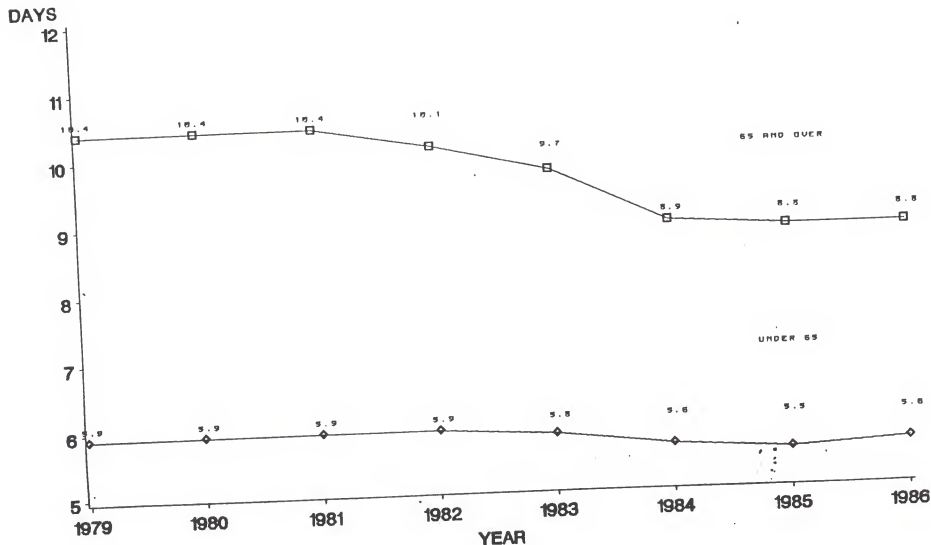
Since the most commonly accepted expectation about PPS at the time of its inception was that it would result in shorter hospital stays for Medicare patients, it is not surprising that there was a steep decline in Medicare length of stay in FY 1984. Moreover, unlike other trends, there is strong evidence that this reduction in length of stay is related to PPS.

Data on average lengths of stay between 1979 and 1986 for patients aged 65 and older and for patients under age 65 are presented in Figure 3.2. As stated above, the older group is composed almost completely of Medicare beneficiaries, while the younger group is predominately composed of non-Medicare patients. As this figure shows, average length of stay for the older group fell by about 15 percent between 1979 and 1986, with most of this decline coming in 1983 and 1984--at the onset of PPS. Average length of stay for the younger group fell by only about 5 percent between 1979 and 1986.

More direct evidence of the influence of PPS on length of stay is provided by Feder, Hadley, and Zuckerman (1986), who analyzed data for a sample of 827 hospitals in 1980, 1982, and 1984, obtained from a series of surveys conducted by the AHA. To isolate the impact of PPS, they grouped hospitals according to whether they were paid under the provisions of the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) or under PPS during their cost reporting periods ending in 1984. PPS hospitals in their sample were further grouped according to an index of the degree of financial pressure they were expected to feel under PPS (based on a comparison of their payment rates under PPS and their pre-PPS cost trends). Presumably, hospitals with PPS payment rates most substantially below their projected pre-PPS costs would feel greatest pressure to change their pre-PPS behavior. The strength of the PPS effect would then be reflected not only in the difference between TEFRA and PPS hospitals but also in differences among PPS



FIGURE 3.2  
AVERAGE LENGTH OF STAY BY AGE GROUP  
1979-86



SOURCE: AMERICAN HOSPITAL ASSOCIATION,  
NATIONAL HOSPITAL PANEL SURVEY REPORT,  
DECEMBER 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986

hospitals according to the degree of financial pressure that they would have been expected to feel under PPS.

Feder, Hadley, and Zuckerman found that average lengths of stay did indeed decrease more sharply at PPS hospitals than at TEFRA hospitals (see Table 3.5) for both Medicare patients (among whom there was a 14.6 percent decrease at PPS hospitals versus a 7.9 percent decrease at TEFRA hospitals) and non-Medicare patients (among whom there was a 5.4 percent decrease at PPS hospitals versus a 3.5 percent decrease at TEFRA hospitals). The rate of decrease for Medicare patients was greater than that for non-Medicare patients at both TEFRA and PPS hospitals and at hospitals in all three PPS impact groups.<sup>1</sup> Most striking of all, the decrease in length of stay was directly related to the degree of expected financial pressure under PPS. This combination of results suggests that a significant portion of the recent decrease in length of stay may, in fact, be attributed to PPS.

The distribution of decreases in Medicare length of stay by hospital characteristics is shown in Table 3.6. These data differ from those cited above in that they are based only on "PPS-eligible" Medicare stays--that is, Medicare stays at short-stay hospitals in the 46 original PPS States (all but Maryland, Massachusetts, New Jersey, and New York) and the District of Columbia, excluding stays in psychiatric, rehabilitation, or alcohol/drug units. Table 3.6 displays length of stay figures for 1981 (the base year for the original PPS payment rates), non-PPS and PPS discharges in FY 1984 (the year in which hospitals began to be paid under PPS),<sup>2</sup> and FY 1986. These

---

<sup>1</sup> The "most severe" group consists of those hospitals that would be expected to be under the most severe pressure to cut their costs below the level projected from their pre-PPS trends.

<sup>2</sup> Since each hospital's participation in PPS began with the start of its own fiscal year, only about half of the Medicare short-stay hospital discharges during FY 1984 were paid under the new system.

Table 3.5  
CHANGES IN AVERAGE LENGTHS OF STAY  
FOR MEDICARE VS. NON-MEDICARE PATIENTS  
BY HOSPITAL PAYMENT GROUP, 1982-84

<u>Payment Group</u>	<u>Percentage Change in Medicare Length of Stay</u>	<u>Percentage Change in Non-Medicare Length of Stay</u>
TEFRA	- 7.9	- 3.5
PPS	-14.6	- 5.4
<u>By Potential Impact of PPS:</u>		
--Most Severe	-17.5	- 6.1
--Intermediate	-14.8	- 5.2
--Least Severe	-11.1	- 4.9

Source: Feder, Hadley, and Zuckerman (1986).

Table 3.6

PRE- AND POST-PPS TRENDS IN LENGTH OF STAY  
FOR "PPS-ELIGIBLE" DISCHARGES<sup>a</sup>  
BY HOSPITAL GROUP

Hospital Group	Length of Stay				Percent Difference		
	Non-PPS Stays CY81	Stays FY84	PPS Stays FY84	Stays FY86	Non-PPS CY81-FY84 <sup>b</sup>	1984 PPS vs. Non-PPS	PPS FY84-86 <sup>c</sup>
All hospitals	9.8	9.1	8.0	7.9	- 2.7	-12.1	- 0.6
Urban	10.3	9.5	8.4	8.3	- 2.9	-11.6	- 0.6
o <100 beds	8.2	7.7	6.8	6.7	- 2.3	-11.7	- 0.7
o 100-404 beds	10.0	9.2	8.1	8.0	- 3.0	-12.0	- 0.6
o 405-684 beds	11.0	10.0	9.0	8.8	- 3.4	-10.0	- 1.1
o 685+ beds	11.4	10.6	9.3	9.1	- 2.6	-12.3	- 1.1
Rural	8.6	7.8	6.9	6.8	- 3.5	-11.5	- 0.7
o <100 beds	8.0	7.2	6.3	6.1	- 3.8	-12.5	- 1.6
o 100-169 beds	8.8	8.0	7.1	7.0	- 3.4	-11.3	- 0.7
o 170+ beds	9.6	8.7	7.9	7.9	- 3.5	- 9.2	0.0
New England	10.8	9.7	9.2	9.1	- 3.8	- 5.2	- 0.5
Mid-Atlantic	11.6	10.4	8.7	8.7	- 3.9	-16.3	0.0
South Atlantic	9.8	9.3	8.1	8.3	- 1.9	-12.9	+ 1.2
E. No. Central	11.0	9.9	8.7	8.3	- 3.8	-12.1	- 2.3
E. So. Central	9.3	8.8	7.8	7.8	- 2.0	-11.4	0.0
W. No. Central	9.6	8.6	7.6	7.5	- 3.9	-11.6	- 0.7
W. So. Central	8.8	8.5	7.4	7.4	- 1.3	-12.9	0.0
Mountain	8.5	7.9	7.0	6.8	- 2.6	-11.4	- 1.4
Pacific	8.5	7.9	6.9	7.0	- 2.6	-12.7	+ 0.7
Major Teaching	11.4	10.5	9.5	8.9	- 2.9	- 9.5	- 3.2
Other Teaching	10.8	9.9	8.8	8.6	- 3.1	-11.1	- 1.1
Non-Teaching	9.1	8.4	7.5	7.4	- 2.9	-10.7	- 0.7
Not-for-Profit	10.1	9.3	8.1	8.1	- 3.0	-12.9	0.0
Proprietary	9.0	8.4	7.4	7.5	- 2.5	-11.9	0.7
Government	9.1	8.4	7.5	7.4	- 2.9	-10.7	- 0.7

<sup>a</sup>"PPS-Eligible" discharges are discharges that would have been subject to prospective payment had they been discharged on September 30, 1984. This group thus does not include discharges at types of facilities and units excluded from PPS as of that date, or any discharges in New York or Massachusetts.

<sup>b</sup>Compounded annual rate of change between CY 1981 and FY 1984.

<sup>c</sup>Compounded annual rate of change between FY 1984 and FY 1986.

NOTE: Data in this table are based on bills processed by HCFA through December 1986, and are thus preliminary and subject to revision.

Source: Health Care Financing Administration, Bureau of Data Management and Strategy.

figures indicate that, although length of stay for all types of hospitals decreased substantially with the implementation of prospective payment, the decrease in length of stay for PPS stays appears to be leveling off: for PPS stays, the average length of stay for FY 1986 (excluding New York and Massachusetts) was approximately the same as that in FY 1984.

These results would seem to conflict with the overall Medicare trend data, which (in Table 3.4) show an apparent continuation in the decline of Medicare average length of stay through FY 1986. However, this apparent inconsistency probably reflects the continuing increase in the number of hospitals covered under PPS. In FY 1984, only about half of all Medicare short-stay hospital bills were paid under PPS; in FY 1985, almost all Medicare short-stay hospitals in the 46 original PPS States and the District of Columbia were under prospective payment. Thus, even without a further decrease in either PPS or non-PPS lengths of stay, the increasing number of (shorter) PPS stays would have resulted in a decrease in the overall Medicare average in FY 1985. The further reduction in overall Medicare average length of stay in FY 1986 is probably largely due to reduced average length of stay in Massachusetts and New York (from 12.6 to 10.7 days in the two States combined between FY 1985 and FY 1986), as they dropped their waivers and were included in the nationwide PPS system.

A closer look at the pattern of changes in length of stay was taken by Pope (1987), who examined the distribution of Medicare length of stay for a sample of 1,819 urban hospitals between the year that TEFRA was in effect (hospitals' cost reporting periods beginning during FY 1983) and the first year of PPS (hospitals' cost reporting periods beginning during FY 1984). This analysis was intended to shed light on the extent to which the reduction in Medicare length of stay under PPS was being accomplished through the convergence of individual hospitals to local or national norms.

Pope found that the entire distribution of Medicare length of stay in urban hospitals shifted down almost uniformly between the TEFRA year and the first PPS year (see Table 3.7). At the higher end of the distribution, the 95th and 75th percentiles in Pope's sample each decreased by 14.0 percent, and the median decreased by 13.4 percent. Surprisingly, the decrease at the lower end of the distribution was as large as at the higher end, with the 25th and 5th percentiles decreasing by 13.1 percent and 14.1 percent, respectively--thus indicating that the incentive to cut lengths of stay was effective even among hospitals that already had short stays, on average.

The variance of average length of stay for Pope's sample of urban hospitals also decreased substantially (24.3 percent) between the TEFRA year and the first PPS year.<sup>3</sup> As shown in Table 3.8, most of this reduction in variance was accounted for by changes within, rather than between, regions and census divisions. However, almost three-quarters of the reduction in variance was accounted for by changes between Metropolitan Statistical Areas (MSAs). This indicates that the reduction in length of stay during the first year of PPS may have been due more to a compression among local area norms across the country than to a compression among hospitals within local areas. This would support the argument that PPS encourages increased conformity in practice patterns across local areas, while also indicating that some diversity within local areas remains.

---

<sup>3</sup> It should be noted that an across-the-board percentage reduction in average length of stay would also result in an apparent reduction in variance, due to the decrease in absolute deviations from the mean. Thus, the true extent to which the distribution is compressed may be overstated by the reduction in the variance.

Table 3.7

CHANGES IN THE DISTRIBUTION OF  
AVERAGE MEDICARE LENGTH OF STAY FOR URBAN HOSPITALS  
BETWEEN TEFRA YEAR AND FIRST PPS YEAR

<u>Percentile</u>	<u>TEFRA</u>	<u>PPS</u>	<u>Change</u>	<u>Pct. Change</u>
95th	12.25	10.54	-1.71	-14.0
90th	11.46	9.92	-1.54	-13.4
75th	10.24	8.81	-1.43	-14.0
50th (Median)	8.96	7.76	-1.20	-13.4
25th	7.78	6.76	-1.02	-13.1
10th	6.85	5.86	-0.99	-14.5
5th	6.24	5.36	-0.88	-14.1

Source: Pope (1987).

Table 3.8

DECOMPOSITION OF PERCENTAGE CHANGE IN VARIANCE OF  
AVERAGE MEDICARE LENGTH OF STAY IN URBAN HOSPITALS  
BETWEEN TEFRA YEAR AND FIRST PPS YEAR

	<u>Total Change in Variance</u>	<u>Between Area</u>	<u>Within Area</u>
Four Census Regions:			
	-24.3%	- 7.0%	-17.3%
Nine Census Divisions:			
	-24.3	- 9.5	-14.8
MSAs:			
	-24.3	-17.5	- 6.8

Source: Pope (1987).



## Intensity of Care

### PPS Incentives and Intensity of Care

The data reported in the previous section indicate that, while admissions have continued to decline under PPS, length of stay appears to be leveling off. One explanation for this combination of trends is that, with the shift of services away from the inpatient setting, the types of patients who are no longer being admitted to the hospital are those who are less severely ill, and require less care. Those still being admitted under PPS are then more severely ill, on average, than the patient population before PPS, so the amount of care required by these patients (and the duration of inpatient stays) is also greater, on average.

The impact of PPS on the intensity of care, then, appears to depend on the relative importance of two conflicting factors. On the one hand, if the patients who are admitted are more severely ill and require more care, then an increase in intensity should be observed. On the other hand, the incentive to economize under PPS may encourage hospitals to reduce the intensity of care. Moreover, some services (such as pre-operative testing) that were previously considered part of the inpatient stay are increasingly being provided on an outpatient basis, which may lead to a decrease in the volume of services provided per stay.

The existence of these conflicting factors makes the analysis of trends in the intensity of care very difficult. Furthermore, with the steep decline in length of stay under PPS, the question of whether to define intensity on a per stay or per diem basis becomes increasingly important. This section presents descriptive data on several potential indicators of intensity, in order to provide a basis for additional research.

### The Medicare Case Mix Index

The Medicare Case Mix Index (CMI) is a measure of the expected amount of hospital resources required in the treatment of Medicare patients. It is based on the relative weight assigned to each diagnosis-related group (DRG), which is an indicator of the relative costliness of cases in that group. The CMI for a particular hospital or group of hospitals is calculated by taking the average of the relative weights for cases treated by that hospital or group of hospitals.

In principle, therefore, the CMI should provide a measure of severity of illness, which, in turn, should be related to the intensity of care required by Medicare hospital patients. In practice, however, the use of the CMI to measure the severity of illness of Medicare patients or the intensity of care provided to those patients is subject to several limitations. First, although the DRG system certainly provides a substantial adjustment for case mix, there is considerable variation in per case costs within DRGs--indicating that DRGs may not be an extremely precise measure of differences in severity of illness. Since the CMI is based on the DRG weights, it reflects this imprecision. Second, since assignment of cases to DRGs is a major determinant of the payment received under PPS, hospitals are likely to place increased emphasis on the accuracy of their coding practices (commonly referred to as "DRG creep"). This is likely to affect the comparability of pre- and post-PPS values for the CMI. Pre- and post-PPS comparability is further reduced by the availability of more complete diagnostic data on post-PPS hospital bills, allowing for more precise DRG assignments--usually to DRGs with higher relative weights.

Carter and Ginsburg (1985) found that almost 75 percent of the change in the CMI between 1981 (the base year for the initial PPS relative weights) and FY 1984 (the first year of prospective payment) could be attributed to coding practice changes. Of this portion, slightly over half was found to be due to data improvements and slightly under half due to PPS-induced changes in hospital coding. More recent data (Carter and Ginsburg, 1986) indicate that, although coding practice changes continued to be a factor in the increase in the CMI between FY 1984 and FY 1985, they were less important than in the earlier interval, accounting for an estimated 35 percent of the CMI increase.

Changes in the CMI for PPS-eligible stays in hospitals in the 46 original PPS States and the District of Columbia between 1981 and FY 1984 (non-PPS stays only), between non-PPS and PPS stays in FY 1984, and between PPS stays in FY 1984 and FY 1986 are shown in Table 3.9. The measured CMI for non-PPS stays only increased at an annual rate of 1.3 percent between 1981 and FY 1984. In contrast, the difference between non-PPS and PPS stays during FY 1984--that is, during the same year for essentially the same group of cases at the same group of hospitals--was 4.1 percent. The CMI has continued to increase rapidly (at an annual rate of 3 percent) since FY 1984 (although more recent data indicate that this increase may be leveling off). The CMI has increased under PPS for every hospital group, although some groups have had larger increases than others. For instance, urban hospitals, whose CMI was 12.7 percent higher than that for rural hospitals before PPS, have had an 11.3 percent increase in their CMI under PPS, compared with an 8.2 percent increase for rural hospitals. Hospital size also seems to be related to both the CMI and its rate of increase under PPS, and major teaching hospitals have had a large increase in CMI under PPS, as well.

Table 3.9

PRE- AND POST-PPS TRENDS IN MEDICARE CASE MIX INDEX  
BY HOSPITAL GROUP  
"PPS-ELIGIBLE" DISCHARGES ONLY<sup>a</sup>

Hospital Group	Case Mix Index				Percent Difference		
	Non-PPS Stays CY81	PPS Stays FY84	PPS Stays FY84	PPS Stays FY88	Non-PPS CY81-FY84 <sup>b</sup>	1984 PPS vs. Non-PPS	PPS FY84-88 <sup>c</sup>
All hospitals	1.0445	1.0971	1.1422	1.2112	+ 1.3	+ 4.1	+ 3.0
Urban	1.0711	1.1280	1.1818	1.2580	+ 1.9	+ 4.8	+ 3.1
o <100 beds	0.9744	1.0091	1.0432	1.0934	+ 1.3	+ 3.4	+ 2.4
o 100-404 beds	1.0534	1.1022	1.1515	1.2157	+ 1.7	+ 4.5	+ 2.7
o 405-684 beds	1.1088	1.1761	1.2345	1.3289	+ 2.2	+ 5.0	+ 3.7
o 685+ beds	1.1279	1.2097	1.2964	1.3873	+ 2.6	+ 7.2	+ 3.4
Rural	0.9758	1.0013	1.0445	1.0836	+ 0.9	+ 4.3	+ 1.9
o <100 beds	0.9471	0.9694	1.0080	1.0313	+ 0.8	+ 4.0	+ 1.1
o 100-169 beds	0.9846	1.0178	1.0550	1.0994	+ 1.2	+ 3.7	+ 2.1
o 170+ beds	1.0238	1.0475	1.1000	1.1599	+ 0.8	+ 5.0	+ 2.7
New England	1.0827	1.1360	1.1730	1.2403	+ 1.8	+ 3.3	+ 2.8
Mid-Atlantic	1.0865	1.1130	1.1643	1.2037	+ 0.9	+ 4.6	+ 1.7
South Atlantic	1.0389	1.1028	1.1353	1.2027	+ 2.2	+ 2.9	+ 2.9
E. No. Central	1.0591	1.1048	1.1368	1.2054	+ 1.5	+ 2.9	+ 3.0
E. So. Central	1.0075	1.0434	1.0767	1.1379	+ 1.3	+ 3.2	+ 2.8
W. No. Central	1.0207	1.0691	1.1467	1.2278	+ 1.7	+ 7.3	+ 3.5
W. So. Central	0.9857	1.0686	1.1167	1.1939	+ 3.0	+ 4.5	+ 3.4
Mountain	1.0603	1.1058	1.1702	1.2432	+ 1.5	+ 5.8	+ 3.1
Pacific	1.0921	1.1430	1.2088	1.2750	+ 1.7	+ 5.8	+ 2.7
Major Teaching	1.1526	1.2244	1.2858	1.3809	+ 2.2	+ 5.0	+ 3.6
Other Teaching	1.0949	1.1492	1.2275	1.3018	+ 1.8	+ 6.8	+ 3.0
Non-Teaching	1.0114	1.0549	1.0944	1.1515	+ 1.5	+ 3.7	+ 2.6
Not-for-Profit	1.0583	1.1148	1.1608	1.2325	+ 1.9	+ 4.1	+ 3.0
Proprietary	1.0124	1.0515	1.1070	1.1729	+ 1.4	+ 5.3	+ 2.9
Government	1.0118	1.0579	1.0903	1.1488	+ 1.6	+ 3.1	+ 2.6

<sup>a</sup>"PPS-Eligible" discharges are discharges that would have been subject to prospective payment had they been discharged on September 30, 1984. This group thus does not include discharges at types of facilities and units excluded from PPS as of that date, or any discharges in New York or Massachusetts.

<sup>b</sup>Compounded annual rate of change between CY 1981 and FY 1984.

<sup>c</sup>Compounded annual rate of change between FY 1984 and FY 1988.

NOTE: Data in this table are based on bills processed by HCFA through December 1986, and are thus preliminary and subject to revision.

Source: Health Care Financing Administration, Bureau of Data Management and Strategy.

### Other Measures of Intensity

The mix of medical versus surgical services provides another indicator of the intensity of care in the nation's hospitals. On average, surgical care is more intensive than medical care, in terms of the resources required during and immediately after the operation. Data from the AHA (1979-86) on the trend in surgical operations per admission indicate that surgery has accounted for a steadily increasing proportion of hospital services in recent years. This increase--from .511 in 1979 to .605 in 1986--reflects a 9.7 percent increase in the number of inpatient surgeries while admissions decreased by 7.4 percent. Thus, although a higher percentage of surgery is being done on an outpatient basis (see Chapter 7), there is still plenty of surgery being done in the hospital.

The utilization of intensive care, cardiac care, and other special care units is yet another indicator of the intensity of care provided in the hospital. As shown in Table 3.10 (from Kidder, 1987), there was a large increase between the TEFRA year and the first PPS year in the proportion of inpatient days spent in special care units for most types of hospitals. The notable exceptions were the largest urban hospitals, the smallest rural hospitals, hospitals in New England and the Mountain region, and major teaching hospitals. The overall trend may reflect the perceived need on the part of intermediate-sized hospitals to offer more services that establish their identities as providers of comprehensive health care, in an effort to counteract the effects of the shrinking hospital inpatient market.

The evidence presented above seems to support the notion that the intensity of inpatient hospital care is increasing. Data from the AHA (1979-86) show the effect of recent changes in utilization and intensity on

Table 3.10

SPECIAL CARE DAYS AS A PERCENTAGE OF TOTAL INPATIENT DAYS  
BY HOSPITAL TYPE, ALL PATIENTS  
TEFRA YEAR VS. FIRST YEAR OF PPS

<u>Hospital Type</u>	<u>TEFRA</u>	<u>PPS</u>	<u>Percent Change</u>
Urban	6.9%	7.6%	10.0***
o <100 beds	6.9	7.7	11.8***
o 100-199 beds	6.5	7.5	14.8***
o 200-299 beds	6.9	7.8	13.7
o 300-404 beds	7.0	7.3	4.9
o 405-504 beds	7.2	7.2	- 0.2
o >505 beds	7.9	7.6	- 3.0
Rural	5.7	6.3	10.8***
o <50 beds	5.7	6.1	7.6
o 50-99 beds	5.8	6.4	11.6***
o 100-169 beds	5.4	6.1	12.1***
o 170+ beds	5.6	6.2	10.4**
New England	6.1	6.4	5.3
Mid-Atlantic	6.2	7.5	20.7***
South Atlantic	6.4	7.1	11.2***
E. No. Central	5.5	6.2	14.0***
E. So. Central	5.5	6.0	9.4**
W. No. Central	5.5	6.1	9.7***
W. So. Central	6.1	6.6	8.1**
Mountain	6.5	7.0	8.6
Pacific	9.1	9.8	6.9**
Major Teaching	10.7	9.0	-16.3*
Other Teaching	6.8	7.6	10.7***
Non-Teaching	6.1	6.9	11.5***
Not-for-Profit	6.3	7.0	10.7***
Proprietary	6.8	7.5	10.3***
Government	6.2	6.7	8.8***

\*Difference in means between years statistically significant at 10 percent confidence level.

\*\*Difference in means between years statistically significant at 5 percent confidence level.

\*\*\*Difference in means between years statistically significant at 1 percent confidence level.

Source: Kidder (1987).

hospital staffing. Staffing levels per bed were about 10 percent higher in 1986 than they were in 1979, but the increase seems to have taken place before PPS and to have leveled off over the past 5 or 6 years, except for a relatively small drop in staffing that occurred during the first 2 years of PPS. In contrast, personnel per adjusted admission (a weighted average of inpatient admissions and outpatient visits), which may be a better indicator of the potential labor-intensity of hospital services, has increased in every year since 1979.

### Financial Status

#### The Importance of Financial Effects

The incentives provided by PPS are primarily financial incentives. The financial effects of PPS are thus crucial to the success of the system: if hospitals feel no financial pressure, then the incentives built into the system may be ineffective; if the prospective payment rates are too stringent, then hospitals will be forced to cut necessary services or go out of business altogether. In addition to the overall financial effect, the distribution of financial outcomes is important: if the payment system is perceived as being unfair, cooperation between payers and providers--upon which the success of the system depends, to a great extent--will deteriorate. Also, since the basis of PPS is to reward efficiency while penalizing waste, systematic biases in its financial effects would counteract the incentives that prospective payment is intended to provide.

Medicare population) were used to project subsequent aged mortality rates. This was done using a linear time trend model. The dependent variable (the year to year mortality rate) was expressed as a logarithmic function so that the trend would appear as a rate of change. The independent variable (time) was defined to isolate two separate time trends. In the previous report, these time trends were chosen to intersect in 1976. Subsequent analysis of the data has shown that there has been a significant leveling of mortality beginning in 1979. Use of 1979 as the intersection of the two time trends produced a better fit of the model in terms of the R-squared statistic and the statistical significance of the regression coefficient, so the 1979 inflection point was chosen for the updated analysis.

The results of this analysis are presented in Table 4.12. The regression model fit the data very well, with an R-squared value of 0.97. The estimated rate of change coefficient for the 1968 to 1979 time period was -2.2 percent, and for the 1979 to 1983 time period the coefficient was -0.6 percent, reflecting the leveling off of the mortality trend indicated by the raw data. The table shows the actual age-adjusted mortality rates for each of the years from 1968 through 1985, as well as the predicted rates from the model and an estimated confidence interval of plus and minus two standard deviations from the predicted rate.

In 1985, the predicted mortality rate for aged persons was 5,054 per 100,000 beneficiaries. The actual rate was 5,140, or 1.7 percent higher than predicted by the model. However, as shown by the confidence intervals, this rate was within the bounds of year-to-year variations experienced in previous years. That is, the actual mortality rate was not statistically different from previous trends.



Table 4.12

Estimated and actual mortality rates per 100,000 aged  
population U.S., 1968-1985

Year	Actual Mortality rate/100,000	Low Estimate (-2 std.div)	Predicted Mortality rate/100,000	High Estimate (+2 std.div)
1968	6,637	6,383	6,606	6,838
1969	6,449	6,244	6,463	6,689
1970	6,152	6,108	6,322	6,543
1971	6,141	5,975	6,184	6,401
1972	6,171	5,845	6,050	6,262
1973	6,101	5,718	5,918	6,126
1974	5,857	5,594	5,789	5,992
1975	5,550	5,472	5,664	5,862
1976	5,527	5,353	5,540	5,734
1977	5,357	5,236	5,420	5,610
1978	5,336	5,122	5,302	5,488
1979	5,170	5,088	5,266	5,450
1980	5,367	5,053	5,230	5,413
1981	5,186	5,018	5,194	5,376
1982	5,101	4,984	5,159	5,339
1983	5,140	4,950	5,123	5,303
1984	5,100	4,916	5,088	5,267
1985	5,140	4,883	5,054	5,231

Source: National Center for Health Statistics: Annual Summary of Births, Marriages, Divorces, and Deaths: United States (Age adjusted to the 1980 age distribution of aged beneficiaries).

It should be noted that the validity of this projection procedure--and the statistical level of confidence in the results--decreases with each additional year of projection from the same baseline. In the analysis above, mortality rates are projected through 1985, 2 years beyond the pre-PFS baseline. As future projections extend even further beyond the pre-PFS baseline, deviations from the original trend line will become increasingly difficult to interpret.

Disabled Population. This section focuses on the overall mortality of the Medicare disabled population. The data are taken from the Medicare enrollment files for the years 1980 through 1985. Data are presented for the U.S. as a whole and are not broken into PFS States and waiver States.

Unlike the aged Medicare population, which includes nearly the entire population aged 65 and over, only certain disabled persons, who apply and meet the criteria for entitlement, are covered by the Social Security disability program and thus become Medicare enrollees. Consequently, to the extent that the criteria for enrollment may change, the demographic characteristics of the disabled population under Medicare can shift more abruptly than those of the aged population over time. In 1981, the Medicare disabled population reached its highest level of 3.3 million (the number of people who have been enrolled at some time during the year). By 1985, enrollment had declined by 3.4 percent, to less than 3.2 million. This decline, however, was not evenly distributed across age groups. Enrollment in the under 35 and 35 to 44 age groups grew by 6 percent and 18 percent, respectively, while enrollment in the 45 to 54, 55 to 59, and 60 to 64 age groups declined by 9 percent, 14 percent and 5 percent, respectively. These differences may reflect the different reasons for entitlement within the age

groups. About 38 percent of disabled enrollees under age 45 qualify as adults disabled as children. Most of these persons are mentally retarded. In contrast, most disabled enrollees aged 45 to 64 are eligible due to work disabilities. Given the decline in Medicare entitlement among the working-age population, it may be that, although the age distribution of the disabled population is lower than it was in the early 1980s, the relative severity of disability may be greater.

Mortality rates were calculated by age and sex groups for the years 1980 through 1985, based on total deaths occurring during the year and the total number of persons ever enrolled during the year. Each year's mortality for all disabled persons was then age-adjusted to the age distribution of disabled persons in 1980 through the direct method.<sup>1</sup>

The results of this analysis are shown in Table 4.13. Overall mortality among the disabled during these years was about 3 percent, ranging from a low of 2.9 percent in 1982 to a high of 3.1 percent in 1985. Adjusting the rate in each year for the age and sex distribution of the disabled population increases the mortality rate in both 1984 and 1985. It is interesting to note, however, that the changes in mortality were consistently inversely related to the change in the base population. For instance, there was an increase in the numbers of disabled beneficiaries in both age groups under age 45, and these age groups experienced small decreases in mortality (not evident in the table due to rounding), as well. All three age groups 45 and over experienced both decreases in number and increases in mortality. In fact, persons in the 55 to 59 age group experienced both the largest decline in population (14 percent between 1981 and 1985) and the largest increase in mortality (from 4.6 percent to 5.2 percent). This relationship between

---

<sup>1</sup> See the previous annual report for a description of this method.

Table 4.13

## Medicare Disabled Mortality: 1980 to 1985

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
	Percent Dying					
Male						
Under 35	1.1	1.0	0.9	1.0	0.9	1.0
35-44	1.7	1.7	1.5	1.6	1.6	1.6
45-54	3.0	3.1	3.0	3.0	2.9	3.1
55-59	5.4	5.4	5.2	5.4	5.5	5.8
60-64	4.0	4.0	3.9	4.0	4.1	4.3
All Males	3.4	3.4	3.3	3.4	3.3	3.4
Females						
Under 35	1.0	0.9	0.8	0.9	0.9	0.9
35-44	1.2	1.3	1.2	1.2	1.3	1.3
45-54	2.1	2.1	2.1	2.2	2.2	2.2
55-59	3.4	3.5	3.4	3.6	3.7	4.0
60-64	2.5	2.5	2.5	2.6	2.6	2.9
All Females	2.3	2.3	2.3	2.4	2.4	2.5
All Persons	3.0	3.0	2.9	3.0	3.0	3.1
Age/Sex Adj.	3.0	3.0	2.9	3.0	3.1	3.2

population growth (or decline) and mortality is consistent with the hypothesis that the severity of disability within age groups is changing over time. It is important to note as well that this change in age- and sex-adjusted mortality seems to be unrelated to the implementation of PPS, having begun in 1983, the year before PPS was implemented.

ESRD Population. This section describes recent trends in the survival rate of patients on renal dialysis. The analysis covers the period from January 1, 1979 through December 31, 1986 and includes all Medicare beneficiaries with ESRD who had entitlement during this time.

The analysis of ESRD population-based mortality in the previous annual report attempted to deal with the apparent changing nature of the ESRD population. Between 1980 and 1984, the number of newly treated patients during the year increased from 18,392 to 25,859, at a compounded annual rate of 8.9 percent. Much of this increase occurred among older patients, particularly among persons aged 75 and over. Mortality rates increased with the increase in number of new patients, suggesting that patients initiating treatment in the more recent years represent a more severely ill population. The analysis in the previous annual report was structured to help control for this potential bias. First, the analysis included all patients alive as of January 1 of each year (not just newly treated patients), and second, patients were only included in each year if they had survived at least 1 year prior to January 1 of that year.

Subsequent analyses suggest that the effect of increasing patient severity probably lasts beyond 1 year. Consequently, a different approach, based on cohorts of newly treated patients, is used here: first, patients were divided into groups (or cohorts) based on the calendar year in which

renal failure occurred; a separate life table analysis was then performed on each cohort starting from January 1 on the subsequent year.

The results of this analysis are shown in Table 4.14. Both cumulative and interval survival rates are shown for cohorts of patients whose renal failure occurred in each of the years 1980 through 1985. For instance, 81.6 percent of the patients whose renal failure occurred in 1980 and who were still alive as of January 1, 1981 survived until January 1, 1982. Of that 81.6 percent, 83.2 percent survived through 1982, resulting in a cumulative survival rate at the end of 1982 of 67.9 percent. Examining the interval survival rates over time within each cohort should show any change in mortality rates and would be unaffected by changes in the composition of newly treated patients. In general, the interval survival rates within each cohort were fairly constant over time. There was, however, a distinct downward trend in survival across cohorts. Each cohort through 1982 had interval survivals of greater than 81 percent. Each of the cohorts subsequent to 1982 had interval survivals of less than 80 percent. Thus, there is no evidence of decreasing survival over time (when examining individual cohorts of patients), and there is strong evidence that the decrease in total ESRD survival is due to increasing severity among patients entitled in the most recent years.

#### Hospital-Related Mortality

Problems in Analyzing Hospital-Related Mortality. As with population-based mortality, there are inherent problems in analyzing hospital-related mortality. Foremost among these is the problem of variations in case mix. Although changing case mix can be a problem in population-based analyses (as

Table 4.14

Dialysis Patient Survival, by year  
by Year of Renal Failure

Year of Renal Failure											
Observation	1980		1981		1982		1983		1984		
	Percent Surviving										
	Year	Cumulative	Interval	Cumulative	Interval	Cumulative	Interval	Cumulative	Interval	Cumulative	Interval
1980	----	----	----	----	----	----	----	----	----	----	----
1981	81.6	81.6	----	----	----	----	----	----	----	----	----
1982	67.9	83.2	81.8	81.8	----	----	----	----	----	----	----
1983	56.7	83.5	67.9	83.0	81.0	81.0	----	----	----	----	----
1984	48.2	85.0	57.0	84.0	66.7	82.3	78.7	78.7	----	----	----
1985	40.5	84.0	47.3	83.0	54.1	81.1	62.1	79.0	78.0	78.0	----
1986	34.0	84.1	39.5	83.5	44.1	81.5	48.9	78.8	61.7	79.0	77.6

Source: ESRD Medical Information System, Health Care Financing Administration

in the analyses of mortality for the disabled and ESRD populations), the problem is much greater in the analysis of outcomes for hospitalized patients. Hospitalized patients, by definition, represent a highly selective group of persons. The decision to hospitalize a patient is based on a variety of factors, including individual physician practice patterns, practice patterns within the specific geographical area, patient preference, payment incentives, and, more recently, oversight functions of PROs (see the discussion in Chapter 8). All of these factors, in addition to the basic condition of the patient, influence the hospitalization decision.

As described in discussion of access and utilization above, there has been an unprecedented decrease in Medicare discharge rates since the advent of PPS. In 1984, discharges per 1,000 aged Medicare beneficiaries decreased by 2.9 percent, followed by an 8.8 percent decrease in 1985. To the extent that these decreases occurred among categories of patients who are at low risk of dying, the resulting pool of hospitalized patients are, consequently, at greater risk of death, on average. Therefore, it is important that any analysis of trends in hospital-related mortality address the issue of changing casemix.

Because of the apparently substantial changes in coding that took place with the implementation of PPS (see Carter and Ginsburg, 1985), longitudinal analysis of pre- versus post-PPS mortality using Medicare claims data could be misleading. Although coding practice changes have been shown to have continued to be a factor in the measurement of DRG case mix, the magnitude of this effect has been found to be smaller than it was in the first year (see Carter and Ginsburg, 1986). Therefore, this analysis focuses on mortality rates for FY 1984 and FY 1985. Although this precludes a pre/post analysis of the impact of PPS on mortality, it is of interest because post-admission



mortality rates increased between FY 1984 and 1985, while there was a significant decrease in the total number of hospitalizations.

The Effect of Case Mix. Thirty-day post-admission mortality rates for all Medicare patients hospitalized during FY 1984 and 1985 are shown in Table 4.15. In FY 1984, there were 2.23 million hospitalizations in the (20 percent sample) MedPAR files, with about 147,000 of these patients dying within 30 days of the hospital admission, for a mortality rate of 6.6 percent. In FY 1985, there were under 2.0 million records in the MedPAR file, and nearly 143,000 deaths within 30 days of admission. Thus, although the mortality rate increased to 7.2 percent, the total number of deaths associated with hospital stays actually decreased.<sup>2</sup> There were significant changes in case mix across DRGs between FY 1984 and FY 1985, primarily in shifts of many surgical cases to the ambulatory setting.

The impact of the changing case mix on expected mortality in FY 1985 is also shown in Table 4.15. Correcting for changes in the diagnostic mix of cases between FY 1984 and FY 1985, using a direct standardization procedure, it was found that, had mortality rates within diagnostic category remained unchanged, the FY 1985 mortality rate would have been 6.9 percent. Thus, changes in diagnostic case mix account for about one-half of the observed increase in mortality.<sup>3</sup>

---

<sup>2</sup> Shortfalls in reporting probably account for part of the declines in FY 1985 in both stays and deaths associated with stays.

<sup>3</sup> A similar analysis was performed using DRG categories. The results were the same--shifts between DRGs accounted for about one-half of the increased mortality between FY 1984 and FY 1985.

Table 4.15  
30 day post admission mortality  
All Medicare patients

	Year	
	<u>FY 1984</u>	<u>FY 1985</u>
Discharges	2,225,571	1,976,447
Deaths	147,136	142,775
Mortality	6.6%	7.2%
Diagnosis Adjusted Mortality	----	6.9%

1 = 1985 mortality rate was adjusted, by the direct method  
for the distribution of diagnoses in 1985 and the 1984  
mortality rates for those diagnoses

Source: FY 1984 and FY 1985 Medpar files, Bureau of Data Management  
and Strategy

Intra-Diagnostic Risk of Death as Measured by Disease Staging. The decline in admissions may have resulted in intra-diagnostic, as well as inter-diagnostic, changes in risk of death. This hypothesis was tested in a study using the computerized disease staging methodology developed by SysMetrics/McGraw Hill (Gonnella, 1986). Disease staging was used because it was developed for the purpose of measuring severity of disease in terms of likelihood of death or residual impairment and it can be generated from the MedPAR data set without additional record abstraction.

Medical staging criteria have been developed for approximately 400 diseases. As a disease advances, it naturally progresses through four general stages of increasing complexity and system involvement:

- o Stage 1: Conditions with no complications or problems of minimal severity;
- o Stage 2: Problems limited to an organ or system; significantly increased risk of complications;
- o Stage 3: Multiple site involvement; generalized system involvement; poor prognosis; and
- o Stage 4: Death.

It is important to recognize that not all patients experience every stage before death, and that the principal disease is not necessarily the cause of death for patients that die. However, patients at higher stages of the principal disease are generally at higher risk of death than patients at lower stages of the same disease. Every diagnostic code on the patient's record is assigned a disease category and is staged.

Since, in its standard form, the staging algorithm returns a stage of 4.0 for any disease qualifying as the cause of death (through evidence of sufficient severity and discharge status of death), the disease staging methodology was modified for this study, to identify the stage of disease attained just prior to death by each deceased patient.

Disease staging accounts for related complications in determining the stage of the principal disease, but it does not account for secondary diseases that are unrelated to the principal disease. Given the significant role that unrelated secondary diseases may play in determining the probability of mortality for any given patient, an operational definition of "unrelated high risk comorbidities" was developed for this study. Any two of a patient's diseases were defined as related to each other if the diagnosis code defining one of the diseases represented a step in the progression of the other disease (as defined in the staging criteria for that disease). By exclusion, the remaining diseases were considered to be "unrelated." These unrelated diseases were considered to be high risk if the probability of death is high for cases in which the disease was the principal disease. Selection was further limited to comorbidities which were judged to be preexisting, thus excluding comorbidities which may have occurred as a result of the care rendered during the hospital stay.

Since the mortality rate was defined as deaths within 30 days of admission as a proportion of the number of admissions, it was necessary to match a single hospital admission with each death. That is, for cases with multiple admissions within 30 days of death, the admission just prior to death was considered most likely to be related in terms of etiology. However, if previous admissions within 30 days of death had the same type and severity of principal diagnosis as the last admission, then the earlier

admission was defined as the one associated with the death. Thus, although all admissions were included in the analysis, only one admission was associated with each death.

A Study of Staging-Adjusted Mortality Rates. The primary objective of this study was to compare FY 1984 and FY 1985 Medicare inpatient mortality rates after adjusting for changes in case-mix. A second objective of the study was to develop a classification system that could be used in cross-sectional as well as longitudinal analyses of mortality rates. A model was developed that collapsed variable combinations with similar mortality rates to form a risk-homogeneous mortality classification system. This classification system was then used to standardize the overall FY 1985 mortality rate based on FY 1984 within-class mortality rates.

The construction of the classification system began with the development of five stratification variables; principal disease (398 levels); disease stage (three levels); number of high risk unrelated comorbidities (0/1/2 or more); age (less than 70/70-79/80 and over); and sex (male/female). Two different classifications were developed, one each for "high mortality" and "low mortality" disease categories.

To identify diseases in the high mortality group, disease categories were ranked based on the total number of deaths within 30 days of admission. The top 20 disease categories by mortality are listed in the top bank of numbers in Table 4.16. Together, these categories accounted for one-half of all admissions in FY 1985 and 71 percent of all deaths within 30 days of admission. Overall, the death rate for these diseases was 10.3 percent, ranging from a high of 27.0 percent for metastatic carcinoma with unstated primary disease to 3.9 percent for other general conditions.

**Table 4.16**  
**Disease Categories selected for Inclusion in**  
**the Staging Risk Adjustment Analysis, 1985**

Category	Name	Discharges	Deaths within 30 days of admission	Percent Dead
815	Coronary Artery Disease-Acute Myocardial Infarction	200,306	20,391	10.2
251	Cerebrovascular Disease (Cerebral or Precerebral)	78,419	9,368	11.9
504	Bacterial Pneumonia	73,930	11,637	15.7
890	Other Cardiovascular Conditions	70,944	8,279	11.7
527	Cancer of the Lung, Bronchus and Mediastinum	25,798	6,318	24.5
525	Bronchitis and Chronic Obstructive Pulmonary Disease	69,077	4,828	7.0
590	Other Respiratory Conditions	49,228	5,056	10.3
821	Arrhythmias and Conduction Disorders	83,409	5,096	6.1
1698	Metastatic Carcinoma with Unstated Primary	12,288	3,323	27.0
690	Other Gastrointestinal Conditions	48,346	4,018	8.3
1290	Other Endocrine and Metabolic Conditions	39,055	4,523	11.6
902	Acute Renal Failure	10,236	2,179	21.3
829	Essential Hypertension	56,484	3,660	6.5
624	Cancer of the Colon and Rectum	21,509	2,456	11.4
1691	Other Neoplasms	11,712	1,450	12.4
1214	Diabetes Mellitus	41,999	2,234	5.3
1693	Other General Conditions	39,967	1,555	3.9
901	Urinary Tract Infections	31,860	2,603	8.2
1001	Carcinoma of the Prostate	19,506	1,399	7.2
1690	Other Bacterial Diseases	5,431	1,386	25.5
Sub-total 20 Conditions accounting for most deaths		989,504	101,759	10.3
813	Aneurysm, abdominal	13,412	2,387	17.8
242	Alcoholism	28,312	1,246	4.4
1305	Acute Granulocytic Leukemia	2,836	893	31.5
808	Tibial Iliac, Femoral or Popliteal Artery Disease	29,010	1,799	6.2
704	Cirrhosis of the Liver	8,826	1,703	19.3
822	Diseases of Aortic Valve	14,840	1,202	8.1
710	Cancer of the Pancreas	8,286	2,685	32.4
903	Cancer of the Genitourinary Sites	24,182	1,161	4.8
290	Other Nervous System Conditions	35,628	1,283	3.6
215	Head Injury, including Intracranial Injury	13,946	1,088	7.8
620	Vascular Insufficiency of Intestine	4,664	1,502	32.2
Sub-total 11 Conditions with significant inter-hospital variation in mortality rate		183,942	16,949	9.2
Total 31 Conditions Selected for Risk Analysis		1,173,446	118,708	10.1
All Conditions in FY 1985		1,976,447	142,775	7.2

Source: FY 1985 20 percent Medpar files, Bureau of Data Management and Strategy

NOTE: Diagnostic categories were selected based on volume of deaths in 1984.

In addition, 11 disease categories exhibiting significant inter-hospital variation in mortality rates were selected. This set of diseases was selected from the next 30 disease categories ranked by mortality. Inter-hospital variation was calculated based on hospital volume quartiles for that disease; that is, hospitals were grouped into quartiles based on numbers of cases, and the quartile groupings were then tested for significant mortality differences across groups. The 11 disease categories selected in this manner are listed in the lower bank of numbers in Table 4.16. These disease categories accounted for an additional 9 percent of admissions and 12 percent of deaths within 30 days of admission in 1985. Mortality rates ranged from a high of 32.4 percent for cancer of the pancreas to a low of 3.6 percent for other nervous system conditions.

For each of these 31 high mortality diseases, a logistic regression model was fitted to the data to test for the significance of the effect of the stratification variables on mortality. Adjacent cells were combined where differences in death rates were not statistically significant (at the 5 percent level of confidence). For instance, it was often the case that, within the same stage, high risk comorbidity, and age category, there was not a significant difference in mortality between males and females. In these cases, males and females would be combined into a single risk-homogeneous group. Similar combinations were made when significant differences were not found between age groups or comorbidity groups. A new model was then fit to the data to estimate a mortality rate for each of the reduced number of strata. If the mortality rates estimated from the reduced model were an adequate summary of the original fully stratified model, as measured by a Chi-square goodness-of-fit test, then the resulting strata were judged to be risk-homogeneous and the reduced classification system was adopted for that

disease. In this manner, the 1,674 potential risk strata (31 diseases x 3 stages x 3 comorbidity groups x 3 age groups x 2 sex groups) were reduced to 709 strata. The number of strata ranged from nine for other neoplasms to 37 for bacterial pneumonia.

The results of this process for cerebrovascular disease is shown in Table 4.17. The procedure described above divided cerebrovascular disease into 25 risk-homogeneous groups. These groups represent a wide range of mortality experience. The overall mortality rate in FY 1984 for cerebrovascular disease was 11.8 percent. This ranged from a low of 3.4 percent for persons under age 70, at stage 1, and with no high risk comorbidities (sex did not significantly differentiate within this group) to 51.5 percent for persons ages 70 and over, at stage 2, and with 2 or more high risk comorbidities. Six cells had mortality rates of less than 10 percent, while eight cells had mortality rates of greater than 30 percent.

The unadjusted mortality rate for cerebrovascular disease increased in FY 1985 to 12.3 percent, with a decrease in number of admissions from 86,915 in FY 1984 to 78,418 in FY 1985. The mortality rates within risk-homogeneous cells in FY 1985 were roughly comparable to the FY 1984 rates, being higher in some cells and lower in others. Applying the cell-specific mortality rates for FY 1984 to the distribution of admissions in FY 1985 yielded an expected mortality rate of 12.3 percent for FY 1985--identical to the unadjusted rate. Thus, although the raw mortality rate for cerebrovascular disease increased from 11.8 percent in FY 1984 to 12.3 percent in FY 1985, this analysis suggests that there was a sufficient increase in severity (in terms of disease stage, high risk comorbidity, age, and sex) to account for all of this increase.



Table 4.17  
Classification Results for Diagnostic Category 251:  
Cerebrovascular Disease (Cerebral or precerebral arteries)

Stage	Stratification Variable			1984			1985			Expected Deaths	Expected Mortal
	High Risk Co-morbidity	Age	Sex	Discharges	Deaths	Percent Dead	Discharges	Deaths	Percent Dead		
	0	70	----	5,196	177	3.4	5,015	206	4.1	171	---
1	0	70-79	----	8,758	490	5.6	9,293	604	6.5	520	---
1	0	80+	----	5,268	722	13.7	6,341	932	14.7	869	---
1	1	70	Male	407	55	13.5	489	83	17.0	66	---
1	1	70	Female	223	46	20.6	294	55	18.7	61	---
1	1	70-79	----	1,002	201	20.1	1,470	298	20.3	295	---
1	1	80+	----	777	247	31.8	1,174	385	32.8	373	---
1	1	80+	----	151	55	36.4	325	158	48.6	118	---
2	0	70	----	8,862	638	7.2	6,442	451	7.0	464	---
2	0	70-79	----	19,011	1,730	9.1	14,013	1,191	8.5	1,275	---
2	0	80+	Male	6,398	915	14.3	5,039	650	12.9	721	---
2	0	80+	Female	12,511	1,539	12.3	9,582	1,073	11.2	1,179	---
2	1	80	----	3,354	808	24.1	3,012	672	22.3	726	---
2	1	80+	----	2,677	838	31.3	2,340	697	29.8	732	---
2	2	70	----	75	29	38.7	80	30	37.5	31	---
2	2	70+	----	326	168	51.5	377	188	49.9	194	---
2	2	70	----	1,966	138	7.0	2,070	170	8.2	145	---
3	0	70-79	----	4,317	397	9.2	4,552	496	10.9	419	---
3	0	80+	----	4,035	658	16.3	4,437	701	15.8	723	---
3	1	70	----	303	67	22.1	317	72	22.7	70	---
3	1	70-79	----	581	123	21.2	758	186	24.5	161	---
3	1	80+	Male	223	82	36.8	321	123	38.4	118	---
3	1	80+	Female	415	115	27.7	558	185	33.2	155	---
3	2	80	----	47	19	40.4	78	26	33.3	32	---
3	2	80+	----	32	13	40.6	41	24	58.5	17	---
Total				86,915	10,270	11.8	78,418	9,657	12.3	9,633	1

To complete the classification system, the remaining 359 low mortality diseases were put into more aggregated risk groups. This classification used principal disease, stage and number of high risk comorbidities. To ensure a minimal level of accuracy for all cell-level mortality rate estimates, a minimum cell size was set at 0.1 percent of total deaths. Since the total number of deaths in the FY 1984 and FY 1985 files was approximately 300,000, the minimum cell size was set at 300 deaths.

Four categories resulted from the low mortality classifications, as follows. The first consisted of five diseases, divided into 26 categories on the basis of stage and comorbidity. The second category consisted of 14 diseases, divided into 37 categories based on stage only. The third category consisted of 31 diseases with sufficient deaths to be considered separately. The fourth category contained the remaining 309 diseases, which were stratified into 16 groups based on body systems. These four categories thus comprised a total of 110 risk-homogeneous groups.

Together with the 31 high risk disease categories, which contained 709 high risk mortality groups, there was a total of 819 risk-homogenous groups included in the analysis. These groups are roughly analogous to the DRG groupings based on payment. That is, just as the DRGs are representative of groups of patients for whom costs are relatively similar, the 819 groupings in this analysis are groupings of patients for whom the probability of death within 30 days of admission is similar.

Comparison of FY 1985 Medicare hospital mortality rates with expected mortality rates based on the adjustment procedure described above is presented in Table 4.18. The table shows total discharges, actual mortality rates, expected mortality rates and the standardized mortality ratio (SMR) for each of the 31 high mortality diseases and the four groups of low

Table 4.18  
30 day post admission mortality rates for Medicare  
FY 1985, by Selected Disease categories

Case	Category	Total Discharges	Actual Percent Dead	Expected Percent Dead	Standardized Mortality Ratio
		6,973	7.8	8.4	.92
215	Head Injury, including intracranial	14,156	4.4	4.4	0.99
242	Alcoholism	78,418	12.3	12.3	1.00
251	Cerebrovascular Disease	17,814	3.6	3.3	1.07
290	Other Nervous System Conditions	73,929	15.7	16.6	0.95**
504	Bacterial Pneumonia	69,077	7.0	6.7	1.04*
525	Bronchitis/Obstructive Pulmonary Disease	25,798	24.5	24.7	0.99
527	Cancer - Lung	49,227	10.3	10.7	0.96*
590	Other Respiratory Conditions	2,332	32.2	34.4	0.94
620	Vascular Insufficiency of Intestine	21,509	11.4	13.1	0.87**
624	Cancer - Colon and Rectum	48,346	8.3	8.3	1.00
690	Other Gastrointestinal Conditions	4,413	19.3	19.2	1.01
704	Cirrhosis of the Liver	4,143	32.4	32.3	1.00
710	Cancer - Pancreas	14,505	6.2	6.5	0.95
808	Tibia, Iliac, Femoral or Pop. Artery Dx	6,706	17.8	18.0	0.99
813	Aneurysm, Abdominal	200,306	10.2	10.9	0.93**
815	Coronary Artery Disease (Acute MI)	83,409	6.1	6.5	0.94*
821	Arrhythmias/Condition Disorders	7,420	8.1	8.7	0.93
822	Disease of Aortic Valve	56,484	6.5	6.7	0.97
829	Essential Hypertension	70,943	11.7	12.4	0.94**
890	Other Cardiovascular Conditions	31,860	8.2	7.6	1.07*
901	Urinary Tract Infections	10,236	21.3	21.3	1.00
902	Acute Renal Failure	12,091	4.8	5.1	0.95
903	Cancer - Genitourinary	19,506	7.2	8.1	0.89*
1001	Carcinoma - Prostate	41,997	5.3	5.4	0.98
1214	Diabetes Mellitus	39,054	11.6	10.6	1.09**
1290	Other Endocrin/Metabolic Conditions	1,418	31.5	29.7	1.06
1305	Acute Granulocytic Leukemia	5,430	25.5	26.4	0.97
1690	Other Bacterial Diseases	11,712	12.4	12.4	1.00
1691	Other Neoplasms	39,951	3.9	4.8	0.80**
1693	Other General Conditions	12,288	27.0	26.1	1.04*
1698	Carcinoma - Unstated Primary	102,205	7.5	7.4	1.00
grp 1	5 Diseases: Stage* Comorb.	176,674	4.8	4.5	1.06**
grp 2	14 Diseases: Stage	288,919	3.1	2.8	1.10**
grp 3	31 Diseases	327,198	2.2	1.9	1.17**
grp 4	16 Body Systems				
	All Discharges	1,976,447	7.2	7.3	0.99*

\* = significant at .05 level  
\*\* = significant at .01 level

Source: FY 1984 and FY 1985 Medpar files; Bureau of Data Management and Strategy, Analysis by Systemetrics/McGraw Hill

mortality diseases. The SMR is merely the ratio of the actual mortality to the expected mortality. Ratios less than 1.0 represent cases in which the actual mortality is less than would have been expected, given the mix of cases across mortality risk groups in FY 1985, and ratios greater than 1.0 represent cases in which the actual mortality is greater than would have been expected, given the FY 1985 mix of cases.

Of the 35 disease groupings, there were 15 in which the SMR was significantly different from 1.0--eight in which the SMR was less than 1.0 and 7 in which the SMR was greater than 1.0. The lowest SMR (0.80) was for other general conditions (an actual mortality rate of 3.9 percent versus an expected rate of 4.8 percent) and the highest SMR (1.17) was for the residual group of 350 diseases which had been grouped solely on the basis of 16 body systems (an actual mortality rate of 2.2 percent versus an expected rate of 1.9 percent).

Overall, the disease staging based classification system accounted for essentially all of the increase in mortality between FY 1984 and FY 1985. The mortality rate for FY 1984 shown in Table 4.15 was 6.6 percent, so a totally unadjusted expected mortality rate for FY 1985 would have been 6.6 percent--considerably below the observed FY 1985 rate of 7.2 percent. Controlling for disease category alone resulted in an expected mortality rate of 6.9 percent. Additional control for stage of illness, high risk comorbidity, age and sex resulted in an expected mortality rate for FY 1985 of 7.3 percent, slightly higher, in fact, than the observed rate.

There are two limitations to this analysis that must be considered. First, there is the possibility that much of the observed increase in stage of illness and comorbidities is due to coding or "DRG creep." As mentioned above, Carter and Ginsburg (1985) showed that most of the initial increase in

case mix (as measured by the CMI) could be attributed to coding practice changes. The case mix index continued to increase through FY 1985, but less of that change could be attributed to coding practice changes (Carter and Ginsburg, 1986). Still, DRG creep remains as a possible explanation for some of the observed increase in the CMI. This problem is not unique to this study but is relevant to any analysis of hospitalization data that uses case mix adjustment techniques. Second, the computerized staging method used in this analysis relies, of necessity, on the information available on the MedPAR files. As such, it describes severity at discharge. It is not possible, using these data, to clearly differentiate between conditions present at admission and conditions arising as a result of the stay itself. Although an attempt was made to eliminate risk factors that could have been caused by the stay (particularly by adjusting for unrelated comorbidities), where possible, some of the measured increase in risk could have been caused by the care provided rather than the condition of the patients on admission.

### Hospital Readmissions

Rehospitalization rates reflect outcomes to the extent that premature discharge or poor quality of care can result in the need for a patient to return to the hospital for additional treatment. Thus, an increase in readmissions might indirectly indicate a change in the quality of care. This section presents summary data on trends in readmission rates among Medicare beneficiaries, covering the years 1979 through 1985. Readmission rates are shown for aged, disabled and ESRD beneficiaries and are displayed for the PPS and waiver States separately.

Readmission rates for the Medicare beneficiary populations for the years 1979 through 1985 are shown in Table 4.19. Readmission rates increased for both the aged and disabled populations during this time. Most of the increase for both groups occurred in 1982, when rates increased by over 10 percent. This increase was observed in both the PPS and waiver States. Since 1982, readmissions have stabilized. Among aged beneficiaries, readmissions in the PPS States ranged between 177 and 180 per 1,000 admissions and readmissions in the waiver States ranged between 159 and 163 per 1,000 admissions. There is no indication of changes in readmissions which are coincident with PPS implementation. Readmission rates among the disabled have similarly remained stable since 1982. In the PPS States, readmissions among the disabled have ranged from 224 per 1,000 in 1982 to 228 per 1,000 in both 1984 and 1985. In the waiver States, readmissions among the disabled have been somewhat lower, ranging from 200 per 1,000 in 1981 to 211 per 1,000 in 1984.

Readmissions are much more common among ESRD beneficiaries than among either aged or disabled beneficiaries. For example, in 1985 in the PPS States, the readmission rate for ESRD beneficiaries (316 per 1,000) was 76 percent higher than for aged beneficiaries (180 per 1,000) and 39 percent higher than for disabled beneficiaries (228 per 1,000). However, as for the aged and disabled, readmissions among ESRD beneficiaries have remained relatively stable throughout the years included in the analysis. The larger year-to-year fluctuations reflect the much smaller sample of ESRD persons, particularly in the waiver States.

Table 4.19

Number of Beneficiaries Rehospitalized within 30 Days of  
Discharge, per 1000 Live Discharges, 1979-1985

	<u>CY</u> <u>1979</u>	<u>CY</u> <u>1980</u>	<u>CY</u> <u>1981</u>	<u>CY</u> <u>1982</u>	<u>CY</u> <u>1983</u>	<u>FY</u> <u>1984</u>	<u>FY</u> <u>1985</u>	<u>Annual</u> <u>% Change</u> <u>1980-83</u>	<u>Annual</u> <u>% Change</u> <u>1983-85</u>
Aged									
PPS States	162	156	161	179	177	178	180	2.2	1.2
Waiver States	137	134	141	159	161	163	163	4.5	0.6
Disabled									
PPS States	191	182	187	204	207	208	228	2.1	0.2
Waiver States	176	163	168	193	182	192	205	0.7	1.5
ESRD									
PPS States	330	301	304	310	317	320	316	1.0	-0.3
Waiver States	337	265	269	310	332	308	291	-0.4	-7.0

Adjusted to the age and sex distribution of 1984 Medicare discharges  
by the direct method

### Beneficiary Liability

Waldo and Lazenby (1984) estimated that Medicare paid slightly less than half of the aged Medicare population's medical bills in 1984. Federal and State Medicaid payments accounted for about 13 percent and other government programs an additional 5 percent of the health care bill for aged Medicare beneficiaries. Nearly all of the remaining 33 percent of the cost of health care for the aged--consisting of coinsurance, deductibles, goods and services not covered by Medicare, and private health insurance premiums--was borne by the individual.

The analysis in this section, covers only that portion of beneficiary liability that is incurred as a result of cost sharing payments for covered Medicare services--specifically, Medicare coinsurance, deductibles, and physician charges on unassigned claims that exceeded allowed charges--due to the lack of data on other expenses born by beneficiaries. The analysis focuses on the question of whether PPS has had a discernible impact on this aspect of liability for all Medicare beneficiaries (including the aged, the disabled, and the ESRD populations).

### Potential PPS Effects on Beneficiary Liability

PPS may affect beneficiary liability in several ways. As described above, average length of stay in acute care hospitals dropped significantly in the first year of PPS. Shorter hospital stays have the potential for decreasing the number of hospital coinsurance days. At the same time, when persons are discharged earlier, they may be sicker and, thus, be more likely to need the services of a skilled nursing facility (SNF) or a home health



agency (HHA). This could result in more SNF admissions and longer SNF stays, thus increasing the number of days requiring coinsurance payments. However, the SNF coinsurance amount is equal to one-half the inpatient hospital coinsurance amount, so the net result of these two countervailing forces may be a decrease in beneficiaries' liability for Medicare coinsurance.

The decrease in average length of stay has resulted in a steep rise in the average cost per day, to which the hospital deductible is tied. This undoubtedly accounts for the large increase in the deductible in 1986, which, because of the lag built into the formula for setting the deductible, was the first time that the PPS-induced reduction in average length of stay would have been reflected.<sup>4</sup> Since the deductible is by far the largest portion of beneficiaries' aggregate liability under Medicare Hospital Insurance (HI), this effect could substantially increase beneficiary liability.

Also as described above, there has been a sharp decline in admissions since PPS was implemented. This would serve to reduce the number of deductible payments for which beneficiaries are liable. On the other hand, to the extent that the decrease in admissions has been accompanied by a shift of some services to the outpatient or office setting when they would ordinarily have been done on an inpatient basis, beneficiary liability may be affected. This kind of shift could lead to an increase in Medicare Supplemental Medical Insurance (SMI) copayments that would not have been incurred under the old system.

Finally--and possibly most important--there is the possibility of incurring additional expenses for noncovered services. A change in the mix

---

<sup>4</sup>According to the statutory formula for its computation, the deductible for 1987 would have been \$572, 16 percent higher than in 1986 and 43 percent higher than in 1985. Because of the size of this potential increase, Congress put an arbitrary cap of \$520 on the deductible for 1987, and limited the amount of future increases.

of services used by Medicare beneficiaries may change the mix of their coverage. For example, some persons who are discharged earlier than they would have been under the old system may need to hire someone to help with routine household chores; thus, rather than using inpatient services that are covered by Medicare, they are forced to use non-acute--but still necessary--services that are not covered. Unfortunately, there are currently no data available with which to study this issue.

### Trends in Beneficiary Liability

In this section, we examine whether the changes that have taken place in recent years have had an impact on beneficiary liability under Medicare. We do so by looking at time series data from calendar years 1977 through 1985 for the different categories of beneficiary liability for covered services. While a deviation from past trends can not prove that PPS was responsible for the change, it can provide at least some indication of a potential impact, particularly if the deviation is in the expected direction.

Table 4.20 shows the amounts of total HI and SMI liability accounted for by each of their components. Aggregate liability increased from \$4.5 billion in 1977 to \$13.5 billion in 1985. Liability per beneficiary also consistently increased over the 9-year period, from \$174 per beneficiary to \$448 per beneficiary. However, the rate of increase declined steadily, from a high of 21 percent in 1981-82 to a low of 3 percent for 1984-85. The most dramatic change in this rate of increase occurred in the first 2 PPS years.

Overall, the rate of change for HI liability declined from a high of 33 percent in 1981-82 to a low of 4 percent in 1984-85. There was a dramatic (24 percent) decrease in the amount of coinsurance per beneficiary in

Table 4.20  
Aggregate Beneficiary Liability, Liability per Beneficiary and Percent Change, 1977-1985

Year	Hospital Insurance					Supplementary Medical Insurance			
	Grand Total	HI Total	Inpatient Hospital		Skilled Nursing Facility	SMI Total	Deductible	Coinsurance	Unassigned Claim
			Deductible	Coinsurance	Coinsurance				
(millions of dollars)									
1977	\$4,489	\$1,091	\$ 844	\$ 171	\$ 76	\$ 3,398	\$1,049	\$1,454	\$ 804
1978	5,046	1,311	1,019	210	82	3,735	1,102	1,723	910
1979	5,898	1,512	1,168	257	87	4,386	1,157	2,072	1,157
1980	7,074	1,807	1,395	312	100	5,267	1,207	2,519	1,541
1981	8,433	2,080	1,615	355	110	6,353	1,358	3,042	1,953
1982	10,388	2,804	2,131	524	149	7,584	1,574	3,730	2,280
1983	11,965	3,302	2,540	584	178	8,663	1,690	4,463	2,510
1984	12,833	3,526	2,870	450	206	9,307	1,763	4,824	2,720
1985	13,523	3,774	3,048	493	233	9,749	1,750	5,297	2,602
(dollars per beneficiary)									
1977	\$ 174	\$ 42	\$ 32	\$ 7	\$ 3	\$ 132	\$ 42	\$ 58	\$ 32
1978	192	49	38	8	3	143	42	66	35
1979	219	55	43	9	3	164	43	78	43
1980	256	64	50	11	4	192	44	92	56
1981	301	73	56	12	4	228	49	109	70
1982	364	96	73	18	5	268	56	132	80
1983	413	112	86	20	6	301	59	155	87
1984	434	118	96	15	7	316	60	164	92
1985	448	123	101	16	8	325	62	177	87
(percent change in dollars per beneficiary)									
1977-78	10%	17%	18%	20%	5%	8%	2%	14%	9%
1978-79	14	12	12	19	3	15	2	18	23
1979-80	17	17	17	19	12	17	2	18	30
1980-81	18	13	14	12	8	19	10	19	25
1981-82	21	33	30	45	33	18	14	21	14
1982-83	14	16	17	10	17	12	5	17	9
1983-84	5	5	11	-24	14	5	2	6	6
1984-85	3	4	5	7	20	3	3	8	-5

1983-84. In 1984-85, coinsurance began to increase again, but the amount per beneficiary remained well below pre-PPS levels. The rate of increase in liability for deductible payments per beneficiary has slowed greatly since PPS--from 17 percent in 1982-83 to 5 percent in 1984-85. This slowing in the increase of deductible and coinsurance liability can, in all likelihood, be attributed to the post-PPS decrease in both the number of hospital admissions and the average length of stay. Liability for SNF coinsurance is increasing at rates considerably higher than the average pre-PPS rate. However, SNF cost sharing still accounts for a very small proportion of aggregate beneficiary liability.

Rates of increase in liability per beneficiary for SMI have also decreased dramatically under PPS, from 12 percent in 1982-83 to 3 percent in 1984-85. Some of this decrease is attributable to decreases in the rate of change for both deductibles and coinsurance. However, the most dramatic decrease in growth rate has been in the beneficiary liability incurred for unassigned claims. In 1984-85, liability per beneficiary for unassigned claims decreased by 5 percent, the only decrease for any category in any of the years shown. There is no apparent reason to attribute the slowing of growth in SMI liability to PPS. These changes are quite likely the result of the freezing of physician payments in July 1984 and the HCFA program that provides incentives for physicians to accept assignment (see McMillan et al., 1985).

#### Summary and Conclusions

This chapter has reviewed recent evidence regarding the possible effects of PPS on Medicare beneficiaries' access to health care (through an analysis

of data on utilization patterns), the quality of the care that they receive (through an analysis of mortality and rehospitalization rates), and their out-of-pocket liability.

#### Access and Utilization

The Medicare population experienced declines in the overall use of hospital care in both 1984 and 1985. However, the nature of the decline differed greatly in the 2 years. In 1984, there were sharp declines in length of stay, with uniform decreases of more than 10 percent across all beneficiary groups (aged, disabled, and ESRD) and by demographic characteristics within beneficiary groups. In 1985, average lengths of stay fell only slightly, ranging from a 4 percent decline among the aged to a 1.2 percent decline among the ESRD population. Discharge rates were less consistent. Among the aged, a moderate decline of 3.5 percent in 1984 was followed by a 9.6 percent decline in 1985. Among the disabled, a 10.1 percent decline in 1984 was followed by a 4.8 percent decline in 1985. The ESRD population experienced a 2.9 percent increase in discharges per 1,000 in 1984 and a 2 percent decline in 1985. As a result, the net decline in total days of care per 1,000 beneficiaries since the beginning of PPS was similar for the aged (24 percent) and disabled (22.6 percent) populations. The decline in the total days of care rate among ESRD beneficiaries was roughly one-half as great (11.9 percent).

Although there have been declines in discharge rates across all age groups among aged beneficiaries, the rate of decline has been lowest among the oldest old. Since the beginning of PPS, persons aged 85 and over have had an 8.4 percent decline in discharges, considerably less than the 15.2

percent decline among persons aged 65 to 69. If PPS is reducing access to hospital care, it seems that its impact is least on this most vulnerable group. On the other hand, to the extent that older beneficiaries are at greater risk of premature discharges, there may be cause for concern. Length of stay reductions were greatest for the oldest elderly (17 percent for persons aged 85 and older versus 12.9 percent for persons aged 65 to 69). Because the need for sub-acute post-hospital care is greatest for older persons, length of stay reductions could pose greater problems for this group. This issue is addressed in more detail in Chapter 5.

Among the disabled, the youngest age group had a decline in discharges per 1,000 of more than 18 percent in 1984. In 1985, this group had an increase in discharges of about 2.7 percent, thus bringing the net change for this age group from the beginning of PPS into line with that for other age groups. This seems to be indicative of a general instability in discharge rates from one year to the next and highlights the caution that should be taken when interpreting results for any single year.

#### Mortality and Rehospitalization

Mortality rates within 30 days of hospitalization for the Medicare population increased from 6.6 percent in FY 1984 to 7.2 percent in FY 1985. The fact that total population-based mortality did not change during this time and that there was an 8.8 percent decline in admission rates is strongly suggestive that there was a change in the mix of patients who were hospitalized. Adjusting the FY 1985 mortality rates on a disease-specific or a DRG-specific basis accounts for about one-half of the increased hospital mortality. An analysis of case mix changes based on the disease staging

methodology developed by Systemetrics, Inc., suggests that most, if not all, of the remaining increased mortality was due to a change in the mix of hospitalized patients.

### Beneficiary Liability

The impact of PPS on beneficiary liability is examined here only from the relatively narrow perspective of Medicare covered services, due to lack of data on other out-of-pocket expenses for Medicare beneficiaries. The most apparent impact of PPS is in the dramatic reduction in liability per beneficiary for inpatient coinsurance days. There has also been a decline in the rate of growth of other components of beneficiary liability for hospital services, caused by the decrease in both the rate of admissions and the average length of hospital stays for Medicare beneficiaries. Other factors behind this trend include changes in the rules for payment of physicians and a decline in the general rate of inflation.

#### REFERENCES FOR CHAPTER 4

- Carter, G.M. and Ginsburg, P.B. The Medicare Case Mix Index Increase: Medical Practice Changes, Aging, and DRG Creep. Santa Monica, California: The Rand Corporation, 1985.
- Carter, G.M. and Ginsburg, P.B. "The Medicare Case Mix Index: Preliminary Results for 1985." Unpublished working paper. Santa Monica, California: The Rand Corporation, July 1986.
- Gonnella, J.S. (ed.) Disease Staging Clinical Criteria (Third Edition). Santa Barbara, California: Systemetrics/McGraw Hill, 1987.
- Gornick, M. "Trends and Regional Variations in Hospital Use Under Medicare." Health Care Financing Review, Vol. 3 (Summer 1982), p. 41-73.
- McMillan, A., Lubitz, J., and Newton, M. "Trends in Physician Assignment Rates for Medicare Services, 1968-85." Health Care Financing Review, Vol. 7 (Winter 1985), p. 59-75.
- McPherson, K., Wennberg, J.E., Hovind, O.B., and Clifford, P. "Small-Area Variations in the Use of Common Surgical Procedures: An International Comparison of New England, England, and Norway." New England Journal of Medicine, Vol. 307 (November 18, 1982), p. 1310-14.
- Riley, G. and Lubitz, J. "Outcomes of Surgery in the Medicare Population: The Relation of Surgical Volume and Other Factors to Mortality." Unpublished working paper. Baltimore, Maryland: Health Care Financing Administration, 1984.
- Siu, A.L., Sonnenberg, F.A., Manning, W.G., Goldberg, G.A., Bloomfield, E.S., Newhouse, J.P., and Brook, R.H. "Inappropriate Use of Hospitals in a Randomized Trial of Health Insurance Plans." New England Journal of Medicine, Vol. 315 (November 13, 1986), p. 1259-66.
- Waldo, D. and Lazenby, H. "Demographic Characteristics and Health Care Use and Expenditures by the Aged in the United States, 1977-1984." Health Care Financing Review, Vol. 6 (Fall 1984), p. 1-29.
- Wennberg, J. "Which Rate Is Right?" New England Journal of Medicine, Vol. 314 (January 30, 1986), p. 310-11.
- U.S. Department of Health and Human Services. Report to Congress: The Impact of the Medicare Hospital Prospective Payment System, 1985 Annual Report. Washington, D.C.: 1987.



Chapter 5  
IMPACT ON POST-HOSPITAL CARE

Introduction

Overview

The data presented in Chapters 3 and 4 indicate that the average length of inpatient hospital stays for Medicare patients decreased rapidly in response to PPS incentives. Given this tendency toward shorter stays, it would not be surprising to see an increase in the use of post-hospital services by Medicare beneficiaries, as these services are substituted for some of those that used to be provided on an inpatient basis. Also, since quicker discharge means that patients are discharged at an earlier point in the recovery process, an increase in the average severity of illness and degree of functional dependency of patients who are using post-hospital services is to be expected. Thus, the "quicker and sicker" phenomenon is a logical result of PPS incentives. To the extent that it reflects the provision of necessary care in more appropriate settings, this phenomenon may, in fact, be associated with a desirable change in the health care system; to the extent that it reflects a decrease in the availability or quality of necessary inpatient care, or results in an overburdening of patients and/or providers of post-hospital care, it may indicate undesirable effects.

As mentioned in Chapter 1, Section 9305(1) of the Omnibus Budget Reconciliation Act of 1986 (OBRA86, Public Law 99-509) requires that, in each annual report in this series, beginning with the report for 1986, the Secretary of Health and Human Services shall include:

- (i) an evaluation of the adequacy of the procedures for assuring quality of post-hospital services furnished under title XVIII of the Social Security Act,
- (ii) an assessment of problems that have prevented groups of medicare beneficiaries (including those eligible for medical assistance under title XIX of such Act) from receiving appropriate post-hospital services covered under such title, and
- (iii) information on reconsiderations and appeals taken under title XVIII of such Act with respect to payment for post-hospital services.

This chapter is intended to respond to that congressional mandate.

The chapter focuses on the use of Medicare skilled nursing facility (SNF) and home health agency (HHA) services. The primary emphasis is on utilization patterns and possible insights that they may provide about potential problems that Medicare and Medicaid beneficiaries may have encountered in gaining access to care--particularly those related to the introduction of the Medicare prospective payment system (PPS)

One caveat should be noted here. The SNF and HHA data presented in this chapter include only those services that are covered by Medicare. Thus, any effect that PPS may have had on Medicare beneficiaries' use of post-hospital care that is not covered by Medicare is not captured by the analysis described below.

## Data Sources

The primary sources of data for the analysis of post-hospital care utilization are the SNF and HHA claims files maintained by HCFA as part of the Medicare Statistical System. Data on SNF stays include date of admission, number of covered days, provider number, charges, and reimbursement amount. HHA data include service beginning and ending dates, number of visits by type, provider number, charges, and reimbursement amount. Not all HHA data represent post-hospital care because prior hospitalization is not required for home health coverage, provided other qualifying conditions are met.

Two data bases used in this chapter link specific hospital stay records with SNF and HHA care received within 60 days of discharge. The first is a post-hospital trend data base created by Abt Associates, Inc., for the Health Care Financing Administration (HCFA). It consists of approximately 8,000 randomly selected hospital stay records for each of the calendar years 1981-1985. Each record was linked to all claims for SNF or HHA care received by that beneficiary within 60 days of discharge from the hospital. The second data base, a pre- and post-PPS post-hospital data base developed by the Rand Corporation for HCFA, consists of a 20 percent sample of hospital stay records from each of two time periods: calendar year 1981 and the 12-month period from July 1, 1984 to June 30, 1985. This data base consists of over one million hospital stay records for each of these two 12-month periods. These hospital stay records were linked to all claims for SNF and HHA services received within 190 days of discharge from the hospital to define an episode of care. Data provided in this chapter focus on post-hospital care services received within 60 days of the hospital discharge.

The HCFA "Tape-to-Tape" data base, created by SysTeMetrics, Inc., contains eligibility and claims information for Medicaid recipients, including dual eligibles (patients eligible for both Medicare and Medicaid), in five States.

Data on quality assurance activities relating to post-hospital care were provided by HCFA's Health Standards and Quality Bureau, as were data on reconsiderations and appeals of denied claims.

#### Organization of the Chapter

This chapter is presented in four sections. The bulk of the chapter is devoted to an analysis of the utilization of post-hospital care. This analysis includes an examination of overall trends in SNF and HHA use, and utilization by age group and by diagnosis-related group (DRG). The role of severity of illness and functional impairment at discharge is also examined, as well as the use of post-hospital care by patients who are dually eligible for Medicare and Medicaid.

A HCFA pilot study to collect information on the appropriateness and adequacy of post-hospital care provided to Medicare beneficiaries is also described in this chapter. This is followed by a discussion of quality assessment activities relevant to post-hospital care, and the presentation of some data on the reconsiderations and appeals process.

## Trends in Post-Hospital Care Utilization

### Overall Trends in the Utilization of SNF and HHA Services

The use of SNF services by Medicare enrollees increased steadily between 1981 and 1985, from 9.6 admissions per 1,000 enrollees to 11.8 admissions per 1,000 enrollees (Table 5.1)--an increase of 23 percent. During the same time period, the number of covered days per SNF admission declined by 20 percent, from 29.2 days per stay in 1981 to 23.4 days in 1985. Covered days per 1,000 enrollees increased between 1981 and 1983, and declined thereafter. Since the Medicare Statistical System contains data only on covered days, the trend in total SNF days is unknown.

The home health services utilization rate increased rapidly, from 33 persons served per 1,000 enrollees in 1981 to 51 per 1,000 enrollees in 1985--a 55 percent increase. Most of this increase occurred between 1982 and 1984. However, unlike SNF care, which is exclusively a post-hospital service, HHA services can be unrelated to a hospitalization. The data in Table 5.1 do not reveal whether the increase in the use of home health services was associated primarily with post-hospital care.

It is difficult to determine how much of the change in home health services utilization, if any, is due to EPS. The home health sector has experienced substantial growth in recent years, particularly since the passage of the Omnibus Reconciliation Act of 1980 (Public Law 96-499), which eliminated the 100-visit limit under both Medicare Hospital Insurance (HI, or Part A) and Supplemental Medical Insurance (SMI, or Part B) and the \$60 deductible under Part B. However, since 1982, the number of home health visits per person served has remained relatively constant at between 25 and 27 visits.

Table 5.1  
Medicare Utilization Statistics for Skilled Nursing Facility (SNF)  
and Home Health Agency (HHA) Services, 1982-1985

	Year				
	1981	1982	1983	1984	1985
SNF Care					
Admissions/1,000 Enrollees	9.6	NA	10.7	11.3	11.8
Covered Days/Admission	29.2	NA	29.2	26.6	23.4
HHA Care					
Persons Served/1,000 Enrollees	33	40	45	50	51
Visits/Person Served	23	26	27	27	25

Source: Medicare Statistical System, Health Care Financing Administration

## Trends in Post-Hospital Utilization

Trends in post-hospital utilization are difficult to interpret because of changes in case mix among the hospitalized population. It is thus unclear whether changes in use are due solely to changes in case mix or whether patterns of care are evolving over time. The analysis below describes trends in the utilization of SNF and HHA services in the PPS States (i.e., 46 States and the District of Columbia, which were subject to PPS in FY 1984) and the waiver States (Maryland, Massachusetts, New Jersey, and New York, which were waived from participation in the nationwide system through FY 1985),<sup>1</sup> in an attempt to distinguish between trends that took place in an environment that was directly affected by PPS and trends that may have been only indirectly affected by PPS, if at all.

As shown in Table 5.2, the percentage of hospitalized patients using SNF services in the PPS States did not change substantially in the 2 years before PPS (from 3.16 percent in 1981 to 3.19 percent in 1983), but increased by 44 percent in the first 2 years under PPS (to 4.6 percent in 1985). In the waiver States, there was a slight decrease just prior to PPS (from 1.81 percent in 1981 to 1.76 percent in 1983), followed by a large increase (to 2.49 percent) in 1984 and a decrease (to 2.09 percent) in 1985. These data suggest that PPS may have caused an increase in the frequency of SNF use, although the substantial increase in the waiver States in 1984 suggests that PPS may not have been the only cause of the increase in the PPS States.

The data in Table 5.2 also indicate that PPS may have had a negative effect on covered days per user of SNF services. The number of covered days

---

<sup>1</sup>Massachusetts and New York were included in the nationwide system during FY 1986.

Table 5.2

Percent Live Hospital Discharges Using SNF and HHA Services Within  
60 Days of Discharge and Average Days and Visits per User,  
PPS and Waiver States, 1981-85

SNF Care	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	% Change <u>1981-83</u>	% Change <u>1983-85</u>
PPS States							
Percent Using Services	3.16	2.99	3.19	4.15	4.60	1	44
Covered Days/User	27.4	26.9	24.7	23.7	21.7	-10	-12
Waiver States							
Percent Using Services	1.81	1.79	1.76	2.48	2.09	-3	19
Covered Days/User	25.6	35.2	26.1	25.6	26.0	2	0
HHA Care							
PPS States							
Percent Using Services	9.1	10.9	14.1	16.6	17.9	55	27
Visits/User	11.6	13.3	13.4	14.5	14.2	16	6
Waiver States							
Percent Using Services	15.0	18.3	19.0	19.2	18.8	27	-1
Visits/User	13.5	13.2	15.6	16.8	14.8	16	-5

Source: Post-Hospital Trend Data Base: Abt Associates



per SNF user declined steadily in the PPS States between 1981 and 1985, from 27.4 days to 21.7 days. In the waiver States, however, SNF users had an average of about 26 covered days throughout the period, except for an anomalous average of 35.2 days in 1982.

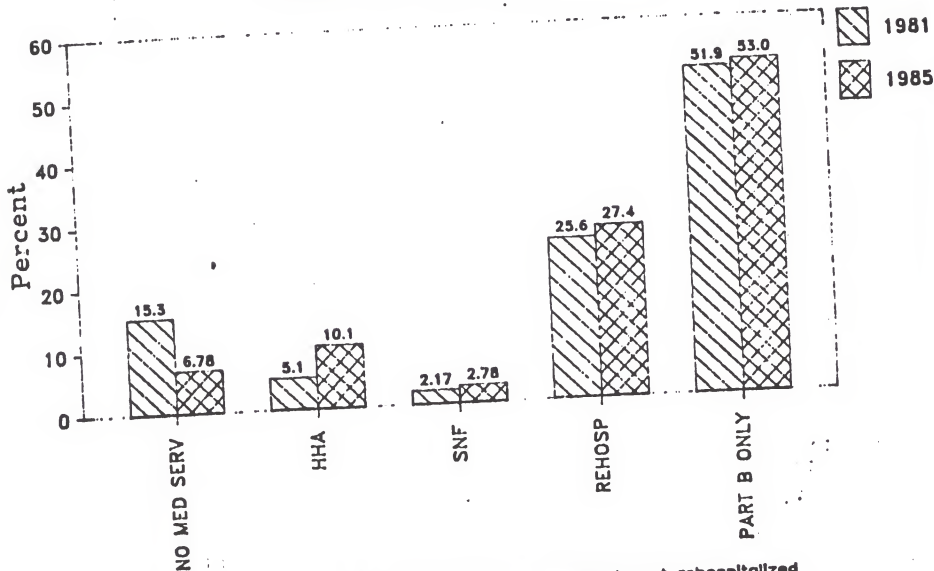
Table 5.2 also shows that the percentage of hospitalized beneficiaries using HHA services increased rapidly in the PPS States between 1981 and 1985, but the pre-PPS increase of 55 percent was twice as great as the post-PPS increase of 27 percent. There was a 27 percent increase in the frequency of HHA use in the waiver States between 1981 and 1983, but there has been practically no change during the PPS period. It is difficult to identify a PPS effect from these data, however, since the much more rapid growth in the frequency of HHA use in the PPS States--both before and since the implementation of PPS--has only served to narrow the difference between the use rate in the PPS States and the initially much higher use rate in the waiver States.

The number of HHA visits per user increased by 16 percent in both the PPS States and the waiver States between 1981 and 1983. The number of visits per user continued to increase in both the PPS States and the waiver States in 1984, but then dropped sharply in the waiver States in 1985, while dropping only slightly in the PPS States. The overall increase of 6 percent in the PPS States during the PPS period, compared to the 5 percent decline in the waiver States, may suggest that PPS has had an effect on HHA visits per user, but it is difficult to tell at this point.

Figure 5.1 shows the distribution of health care services used by Medicare patients within 60 days of hospital discharge in 1981 and in 1985. The percentage of patients that were rehospitalized or who received Part B services only in the first 60 days after discharge increased slightly between

FIGURE 5.7

# WHERE MEDICARE HOSPITAL PATIENTS GO Within 60 Days of Discharge



NOTE: Figures for HHA and SNF care refer only to individuals not rehospitalized  
Post-Hospital Trend Data Base: Abt Associates

1981 and 1985. The percentage of patients using SNF services after discharge increased somewhat, although they still constituted a small minority of all Medicare hospital discharges. The percentage of patients who used HHA services almost doubled, from 5.1 percent to 10.1 percent. There was thus a large reduction in the percentage of beneficiaries who received no covered services within the 60-day post-discharge period, from 15.3 percent in 1981 to 6.8 percent in 1985. Thus it seems clear that some of the reduction in inpatient care (see Chapter 4) has been replaced by other types of services after discharge.

#### Variations in the Use of Post-Hospital Care by State

The use of SNF and HHA services varies considerably across States (Table 5.3). Out of the 47 PPS jurisdictions (46 States and the District of Columbia), 15 had SNF use rates of less than 1.5 percent among the hospitalized beneficiary population in 1981, while 17 had rates of 3 percent or more. Approximately the same degree of geographic variation in SNF use rates was evident in 1984-85, although rates tended to be somewhat higher on average than in 1981. SNF use rates in the PPS States in 1984-85 varied from a low of 0.1 percent in Mississippi to a high of 7.2 percent in Utah.

Use of home health services also varies widely across States. In 1984-85, Alaska had the lowest use rate for HHA services, at 3.8 percent; Connecticut had the highest rate, at 23.8 percent. Every State, though, had an increase in the HHA use rate between 1981 and 1984-85.

The geographic variation in the use of post-hospital care illustrates the difficulty in ascertaining the optimal level of use of such care. Very low use rates may reflect an insufficient supply of post-hospital services in

Table 5.3

Distribution of PPS States with Various Levels of SNF and  
HHA Use Within 60 Days of Hospital Discharge,  
1981 and 1984-85

		Number of States <sup>1/</sup>			
	<u>Total</u>	<u>&lt;1.5% Use</u>	<u>1.5-2.9% Use</u>	<u>3.0-4.4% Use</u>	<u>≥ 4.5% Use</u>
SNF Care					
1981	47	15	15	16	1
1984-85	47	10	15	18	4
		<u>&lt; 6.0 Use</u>	<u>6.0-11.9% Use</u>	<u>12.0-17.9% Use</u>	<u>≥ 18% Use</u>
HHA Care					
1981	47	19	22	5	1
1984-85	47	2	20	18	7

<sup>1/</sup> Includes the District of Columbia

Source: Pre/Post PPS Posthospital Data Base, Rand Corporation

some areas, but the interaction between the availability of some types of care and the practice patterns prevalent in different areas is difficult to sort out. Post-hospital care, and particularly home health care, has become more widely available in general since 1981, and the data show a slight convergence of State post-hospital care use rates between 1981 and 1984-5. Nevertheless, the continuing high variation in use rates for SNF and HHA care across States is cause for concern about access to this care. It is worth noting that SNF and HHA services do not seem to serve as substitutes for each other--there was a positive correlation between State-specific SNF and HHA use rates in both 1981 and 1984-85 (.35 and .21 respectively).

#### Variations in the Use of Post-Hospital Care by Age Group

Use of SNF services is more frequent among older age groups (Table 5.4). In 1985, for example, the rate of SNF use among Medicare beneficiaries' aged 85 and older was 10.58 percent, compared with only 2.64 percent among those aged 65 to 74. Thus, the 85 and over age group accounts for a high proportion of total SNF use among Medicare beneficiaries. There has been some concern that any adverse impacts of FPS might affect this oldest group in particular, because they are especially vulnerable to access problems. However, the data in Table 5.4 do not indicate that this has happened with respect to access to SNF services. Among persons aged 85 and older, SNF use declined by 31 percent in the 2 years prior to implementation of FPS; in the first 2 years of FPS, SNF use increased by 31 percent among this group. It should be noted, however, that increases in use were even higher among the other Medicare age groups.

Table 5.4

Percent of Live Hospital Discharges Using SNF and HHA  
Services Within 60 Days of Discharge in the PPS States,  
by Age, 1981-1985

<u>Age</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>% Change 1981-83</u>	<u>% Change 1983-85</u>
SNF Care							
Total	3.16	2.99	3.19	4.15	4.60	1	44
-65	0.88	0.38	0.67	1.16	1.06	-24	58
65-74	1.53	1.65	1.54	2.23	2.64	1	71
75-84	3.36	4.53	4.49	5.36	6.06	34	35
85+	11.70	7.05	8.09	10.37	10.58	-31	31
HHA Care							
Total	9.1	10.9	14.1	16.6	17.9	55	27
-65	6.3	5.8	10.5	9.3	11.0	68	4
65-74	7.2	8.5	11.8	13.7	14.1	64	20
75-84	11.2	15.1	16.8	20.1	22.9	50	37
85+	13.9	14.7	19.1	23.4	24.3	38	27

Source: Post-Hospital Trend Data Base: Abt Associates

Use of HHA services also increases with age, although not to the same degree as SNF services. All age groups exhibited substantial increases in their rates of use of HHA services in the 2 years prior to PPS, although the oldest group exhibited the smallest increase, at 38 percent. In the 2 years following implementation of PPS, use rates for HHA services continued to rise for all age groups, although the increase for the youngest group (those under 65 years old) was only 4 percent. Overall, these data do not imply an unusual problem with access to HHA services for any age group.

#### Variations in the Use of Post-Hospital Care by DRG

The use of post-hospital care varies substantially across the most frequently occurring DRGs (see Table 5.5). The DRG conditions that most frequently led to post-hospital SNF use were hip and femur procedures except major joint (31.1 percent); major joint procedures (15.7 percent); and specific cerebrovascular disease except transient ischemic attack (13.3 percent). These conditions were also associated with very high rates of HHA use (31.5 percent, 32.0 percent, and 21.7 percent, respectively). In addition, high rates of HHA use were associated with pathological fractures and musculoskeletal and connective tissue malignancy (23.7 percent) and major large and small bowel procedures, age greater than or equal to 70 (22.0 percent). Thus, as might be expected, utilization of post-hospital care seems to be associated with major orthopedic procedures and cardiovascular diseases.

Table 5.5

Percent of Live Hospital Discharges Using SNF and HHA Services  
Within 60 Days of Discharge in the PPS States, for Selected  
Frequently Occurring DRGs, 1984-85

DRG No.	Description	Percent Using SNF	Percent Using HHA
14	Specific cerebrovascular disorders except TIA	13.3	21.7
82	Respiratory neoplasms	3.6	15.5
87	Pulmonary edema and respiratory failure	2.9	16.2
88	Chronic obstructive pulmonary disease	1.5	16.1
89	Simple pneumonia and pleurisy, age $\geq 70$	3.5	12.1
127	Heart failure and shock	2.1	17.8
148	Major large and small bowel procedures, age $\geq 70$	4.2	22.0
182	Esophagitis, gastroenteritis, etc., age $\geq 70$	1.0	9.8
209	Major joint procedures	15.7	32.0
210	Hip and femur procedures, exc. major joint, age $\geq 70$	31.1	31.5
239	Pathological fractures and musculoskeletal and connective tissue malignancy	5.8	23.7
243	Medical back problems	2.1	12.3
296	Nutritional and miscellaneous metabolic disorders, age $\geq 70$	4.7	18.3
320	Kidney and urinary tract infections	4.6	17.7
468	Unrelated OR procedures	4.6	16.6

Source: Pre/Post PPS Posthospital Data Base, Rand Corporation



## The Relationship Between Hospital Length of Stay and Post-Hospital Care Use

An analysis by Abt Associates, Inc., indicates that the declining length of hospital stay may have contributed to greater post-discharge SNF use, but not necessarily to greater post-discharge HHA use (Table 5.6). Patients discharged from hospitals with large length of stay reductions in 1982-84 increased their use of SNF care between 1981 and 1985 by 83 percent; patients discharged from hospitals with small length of stay reductions increased their use of SNF care by only 58 percent. In contrast, patients who were discharged from hospitals with large length of stay reductions increased their use of HHA services by 102 percent, whereas patients discharged from hospitals with small length of stay reductions increased their use of HHA services by 148 percent.

### Duration of Post-Hospital SNF Stays

Table 5.7 contains data for 1981 and 1984-85 on the distribution of patients discharged from the hospital by the number of covered days of SNF care that they used, from an analysis by the Rand Corporation. For example, if a patient was discharged from the hospital in the 1981 sample, there was an 0.41 percent chance that the patient would go into a SNF and be covered for 7 or fewer days. In 1984, that chance would have increased to 0.65 percent. In a sense, the data in Table 5.7 reflect a combination of the propensity to use SNFs with the distribution of covered SNF days, and shows why the average number of covered SNF days has declined. There were many more patients with fewer than 21 covered SNF days in 1984-85 than in 1981, while there was no change in the percentage of patients with longer stays,

Table 5.6

Percent of Live Discharges Using SNF and HHA Services  
Within 60 Days of Discharge by Length of Stay Reductions,  
1981, 1983, 1985

	Percent of Discharges Using Services		
	1981	1983	1985
SNF Care			
Hospitals with large LOS reductions 1982-84	2.69	2.53	4.91
Hospitals with small LOS reductions 1982-84	2.94	3.13	4.65
HHA Care			
Hospitals with large LOS reductions 1982-84	8.95	13.50	18.09
Hospitals with small LOS reductions 1982-84	7.41	12.76	18.39

Source: Post-Hospital Trend Data Base: Abt Associates

Table 5.7

Percent of Live Hospital Discharges Entering SNFs for  
Various Time Periods Within 60 Days of Hospital Discharge  
in the PPS States, 1981 and 1984-85

Number of Covered Days	Percent of Hospital Discharges	
	1981	1984-85
1-7	0.41	0.65
8-14	0.47	0.67
15-20	0.35	0.49
21-30	0.40	0.47
31-45	0.34	0.38
46-60	0.18	0.19
61-80	0.14	0.14
81-99	0.08	0.08
100+	0.12	0.09

Source: Pre/Post PPS Posthospital Data Base: Rand Corporation

except in the case of those covered for the full 100 days allowed under Medicare. The implication of Table 5.7 is that the additional SNF patients in the 1984-85 sample were mostly patients with short SNF stays.

Table 5.7 provides some insight into the quicker and sicker phenomenon. We already know that hospitals are releasing patients quicker, as is shown by dramatic decreases in hospital lengths of stay under PPS. We also know that more patients are using SNF care after being released from the hospital, indicating that they are sicker, in the sense that they may need additional health care after discharge. But we also see a decrease in the average number of covered SNF days, and the reasons for this are not clear. While this decrease could indicate that the average SNF patient is less "sick" than the average SNF patient in the pre-PPS sample, this does not mean that the average patient discharged from the hospital is less sick. In fact, there are about 8 percent more covered SNF days per hospital discharge in our post-PPS sample than in our pre-PPS sample (0.794 versus 0.735).

It could be argued that a decrease in average covered SNF days should be expected to occur under PPS. The logic for such an argument is based on the assumption that hospital discharge decisions would have the greatest effect on the early parts of the SNF stay. It seems unlikely that a hospital's actions would significantly prolong the stay of patients who are already going to spend more than a month in a SNF. In fact, we see that there was very little difference in the percentage of discharges in the post-PPS and pre-PPS samples that stayed more than 30 covered days in a SNF (0.88 to 0.86). The primary difference that we would expect to see would be in the "marginal" patients, who are probably well enough to leave the hospital, but probably not quite well enough to go directly home. Before PPS, the hospital probably would have kept these patients for a few extra days, since they

would have been reimbursed for those days. Under PPS, however, the hospital would not be reimbursed for those last few days, and thus would try to discharge the patient to a SNF, in order to avoid the extra costs of treating the patient for that additional time. Therefore, we would expect that these additional "marginal" patients that go to a SNF would require only a short stay, thus lowering the average number of covered days per SNF patient.

If patients are now being discharged from hospitals in a sicker condition and sent to SNFs for recovery, we cannot tell from these data whether this represents an appropriate use of SNF care, or whether patients are being discharged from the hospital too soon. The relative stability of the rehospitalization rate over time suggests that there is not a widespread problem with inappropriately early discharges.

#### Post-Hospital Care and Condition at Discharge

A study by Forgy and Williams (1987) demonstrates the relationship between patient health status at discharge and the use of post-hospital care. Samples of Medicare discharges were compared for nine hospitals participating in the MedisGroups quality assurance abstracting system in 1982, prior to PPS, and in 1985, after the implementation of PPS. Detailed information was compiled, using Medicare claims records and an independent review of the hospital medical records by quality assurance reviewers.

The sample was limited to cases for which the principal diagnosis was pneumonia or stroke, or for which hip replacement was the principal procedure. A total of about 1,300 discharges were reviewed. Among the information gathered by review of the patient medical records was the severity of illness at admission and at discharge, as well as any dependencies in Activities of Daily Living (ADL) at time of discharge.

Severity of illness was measured at time of discharge (as well as at time of admission) using the MedisGroups system, a proprietary program available from MedisGroups, Inc. MedisGroups uses key clinical findings available from the medical record to group patients into five severity categories, as follows:

0. Patients admitted on a symptomatic basis with no key clinical findings (e.g., back pain, varicose veins);
1. Patients with few abnormal findings whose likelihood of going into organ failure without treatment is remote (e.g., duodenal ulcer, gallstone surgery);
2. Patients with significant findings who may go into organ failure without treatment, but are less likely to do so immediately (e.g., bleeding duodenal ulcer, appendicitis);
3. Patients with severe findings who are very likely to go into organ failure without treatment (e.g., heart failure, perforated appendix); and
4. Patients with critical findings indicating that organ failure is present--that is, the patient is very likely to die without treatment (e.g., cardiac arrest, renal shutdown, ruptured aneurysm).

Patients were also judged to be independent or dependent in any of five common ADL categories at the point of discharge (based on a retrospective review of the medical record): ambulation, transferring (going to and from a resting position), bathing, elimination (toileting), and feeding. The tables presented here have been calculated on the basis of a sample of the three diagnoses which has been weighted so that the averages for both years represent the same diagnostic mix.

According to Table 5.8, the level of illness at both admission and at discharge rose during the study period (1982-85), with particularly pronounced changes in admission severity. The two largest changes in admission severity were the rise in the percentage of patients admitted with severe findings, level 3, and the large drop in the percentage of admissions at level 0 (many of which might be classified as "social admissions"). The largest change in discharge severity appears to be the increase in the percent of patients at level 1 (presumably because they have been discharged before they have recuperated enough to reach level 0).

Similarly, there appears to have been a substantial increase in the percentage of patients with all five ADL dependencies at discharge, while the percentage of patients discharged with no dependencies was substantially lower in 1985 than in 1982.

These data appear to reinforce the observation of the "quicker and sicker" phenomenon. In fact, however, multivariate analysis of these data indicated that the most important determinant of the higher level of discharge severity is the higher level of severity at admission, rather than the shorter average length of stay.

Table 5.9 shows the percentage of patients discharged from hospitals who used HHA services in 1982 and 1985 by levels of severity and dependency at discharge. The highest rate of growth in HHA utilization is clearly among the patients with lower discharge severity levels (0, 1, or 2), while the most severely ill patients comprised a smaller percentage of HHA patients in 1985 than they had in 1982. The largest increases by level of disability was also among the least severe cases.

Use of SNF services remains concentrated among highly dependent patients (Table 5.10), although there does appear to be a trend toward less use of

Table 5.8

Severity at Admission  
(Percent of Live Discharges)

Severity	Year		Change
	1982	1985	
0	14.8	9.1	-5.6
1	21.5	18.1	-3.4
2	39.3	41.8	2.5
3	23.6	30.2	6.6
4	0.9	0.8	-0.1
Total	100.0	100.0	

Severity at Discharge  
(Percent of Live Discharges)

Severity	Year		Change
	1982	1985	
0	68.2	58.5	-9.6
1	19.3	24.6	5.3
2	6.1	9.8	3.7
3	5.1	6.5	1.4
4	1.3	0.6	-0.7
Total	100.0	100.0	

Number of ADL Dependencies  
(Percent of Live Discharges)

No. of Dependencies	Year		Change
	1982	1985	
0	44.8	37.0	-7.8
1	5.9	5.0	-0.8
2	7.8	7.9	0.2
3	8.8	11.5	2.7
4	9.4	9.3	-0.1
5	23.4	29.2	5.8
Total	100.0	100.0	



Table 5.9

HHA Use by Level of Discharge Severity  
(Percentage of Discharges Using Services Within 60 Days)

Severity	Year		
	1982	1985	Change
0	20.5	27.2	6.8
1	22.7	32.3	9.6
2	20.1	32.1	11.9
3	7.0	2.0	-5.0
4	0.0	0.0	-0.0
Total	19.9	27.1	7.2

HHA Use by Number of Dependencies  
(Percentage of Discharges Using Services Within 60 Days)

Severity	Year		
	1982	1985	Change
0	12.1	19.1	7.0
1	14.7	19.2	4.5
2	30.9	40.2	9.3
3	29.8	35.5	5.8
4	32.6	27.5	-5.1
5	23.3	22.8	-0.5
Total	19.8	24.5	4.7

Table 14.5.10

SNF Use by Level of Discharge Severity  
(Percentage of Discharges Using Services)

Severity	Year		Change
	1982	1985	
0	9.8	11.2	1.4
1	14.7	8.3	-6.4
2	20.8	7.5	-13.2
3	16.9	9.6	-7.3
4	0.0	0.0	0.0
Total	11.7	10.0	-1.7

HHA Use by Number of Dependencies  
(Percentage of Discharges Using Services)

No. of Dependencies	Year		Change
	1982	1985	
0	0.0	0.0	0.0
1	4.3	0.0	-4.3
2	3.8	14.3	10.5
3	9.5	5.8	-3.8
4	19.4	20.0	0.6
5	45.5	26.7	-18.8
Total	13.8	11.4	-2.4

SNFs by patients with very high severity and dependency levels. This is somewhat surprising, given the trend toward more severe conditions at discharge and evidence elsewhere in this chapter that SNF use is up for the general Medicare population. This result may reflect the fact that non-Medicare SNF care data are not available; thus, the 41 percent drop in Medicare SNF care for highly dependent persons may represent a shift to Medicaid or private SNF care. It should also be noted that this represents a very small sample of hospital experience.

While there is evidence that the growth in HHA use is a response to higher discharge severity, there is little evidence that it is being used to replace SNF care, as noted earlier. The patterns of change in the two settings are quite different, so that they appear to be serving different groups of patients. Multivariate analysis of these data indicates, in fact, that the growth of HHA services is due to many circumstances, including such things as changes in the supply of HHAs.

Similar preliminary data have been produced from a small study performed in Portland, Oregon by the Northwest Oregon Health Systems Agency. The Oregon study measured dependency at the time of discharge based on medical record data, using a four-item dependency scale, including activity and mobility levels, ability for bathing and maintenance of hygiene, extent and complexity of procedures needed, and extensiveness of signs and symptoms. The sample for this study included approximately 2,600 medical records from Portland area hospitals, divided evenly between a pre-PPS period (October 1981-September 1983) and a post-PPS period (March 1984-July 1985). Five (three medical and two surgical) DRGs were chosen for the pre-/post-PPS dependency comparison and include the following: stroke, pneumonia, heart failure, hip replacement, and major joint pinning. Based on this dependency

scale, statistically significant increases in dependency were found in three of the five DRG categories (pneumonia, stroke, and hip replacement). Neither dependency at admission nor post-hospital use was measured in this study.

#### Pre/Post Changes in Post-Hospital Care for the Functionally Impaired

The data source for this analysis is derived from the National Long-Term Care Survey (NLTCS) of functionally impaired elderly Medicare beneficiaries residing in the community in 1982 and 1984. The functionally impaired elderly were found to represent about 19 percent of the aged Medicare population. Survey data were merged with Medicare claims data and an analysis was conducted by Duke University. These merged records represent cross-sectional samples of approximately 6,000 Medicare beneficiaries in each year. The NLTCS records contain data on the beneficiary's medical condition and abilities to perform ADL and instrumental activities of daily living (IADL) functions. Hence, the research file contains detailed data on case mix, Part A (hospital, SNF, and HHA) utilization, and mortality for two points in time, straddling the implementation of PPS. A clustering methodology (the Grade of Membership, or GOM, technique) was employed to derive relatively homogeneous casemix groups, so that utilization changes could be compared for similar types of cases. The four GOM groups are described briefly as follows:

- o Type I, referred to as "mild disability," has only a modicum of health and functional status problems, with the most distinguishing condition being rheumatism and arthritis.

- o Type II, referred to as the "oldest old," has many ADL problems, with 72 percent being dependent in bed-to-chair transfers. This type is also prone to hip fractures and other breaks.
- o Type III, referred to as "heart and lung problems," has mild ADL dependencies (such as bathing) and IADL dependencies. Arthritis, which is prevalent in this group, is associated with a high risk of permanent stiffness. Most characteristic of this group are high risks of cardiovascular (e.g., 80 percent arteriosclerosis) and lung diseases (e.g., 44 percent bronchitis), which are associated with their high likelihood of diabetes (45 percent) and obesity (50 percent).
- o Type IV, referred to as "severe ADL dependent," has a 60 percent chance of being dependent in eating and 100 percent chance of being dependent in all other ADLs. A high risk of being bedfast (11 percent) or chairfast (32 percent) is characteristic of this group.

HHA and SNF utilization comparisons between 1982 and 1984 for the various GOM groups are displayed in Table 5.11. As was the case for the general Medicare hospitalized population, the study sample had an overall increase in the proportion of discharges utilizing HHAs (23.81 percent) between the pre- and post-PPS time periods. Most of this increase is attributed to the "heart and lung problems" group, which had an increase of 158.9 percent in HHA use between 1982 and 1984. The other GOM groups exhibited smaller changes.

There was a decline in SNF usage of 9.62 percent in the study sample, which is different than the experience of the Medicare population as a whole, as reported earlier in this section. Group I, the least impaired of the GOM groups, exhibited an increase in SNF use of 20.83 percent. The other three GOM groups exhibited declines in SNF use of between 13 and 36 percent.

Table 15.11

Percent of Medicare Beneficiaries Discharged to  
HHAs and SNFs by Year and Grade of Membership Group

<u>HHA</u>		Year		% Change
<u>GOM</u>		<u>1982</u>	<u>1985</u>	<u>1982-84</u>
<u>Group</u>				
I		6.6	6.3	-4.55
II		18.2	15.6	-14.29
III		7.3	18.9	158.90
IV		28.7	29.7	3.48
Total		12.6	15.6	23.81

<u>SNF</u>				
<u>GOM</u>				
<u>Group</u>				
I		2.4	2.9	20.83
II		12.3	10.7	-13.01
III		1.9	1.6	-15.79
IV		10.0	6.4	-36.00
Total		5.2	4.7	-9.62

Source: NLTCS/MEDPAR Data Base: Duke University

### Time Series Analysis of Post-Hospital Utilization

A study is being conducted by Abt Associates, Inc. (Schmitz, 1987) to identify PPS effects on health services utilization, including post-hospital care, using a quarterly time series of Medicare records. Utilization measures for 20 quarters (1981 through 1985) were aggregated from Part A claims (before and after hospital stays), which were linked for 20 percent of all discharged beneficiaries and then aggregated to the hospital-quarter level.

A preliminary descriptive and econometric analysis of PPS effects on utilization, using a 10 percent sample of hospitals from this file, found substantial increases in the quantity of post-hospital care utilized by Medicare beneficiaries, as measured by the percentage of discharges receiving HHA visits or being admitted to SNFs, since the implementation of PPS in the fourth quarter of 1983.

Figures 5.2 and 5.3 show the time series behavior of the quarterly means of these post-hospital care measures. A marked increase in the percentage of discharges experiencing SNF admission within 7 days of discharge is apparent for those hospitals covered by PPS. This pattern is not replicated in those hospitals in the waiver States. HHA visits within 7 days of hospital discharge from a PPS hospital are also increasing rapidly, but much of this trend can be explained by the overall increase in the utilization of HHA services. HHA changes seem unrelated to PPS implementation.

Courtney and Schmitz also conducted a multivariate regression analysis of post-hospital care utilization. PPS effects are isolated by controlling for other explanatory variables and time trends, as well as the effects of the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), in the regression

Figure 5.2  
SNF ADMISSIONS WITHIN 7 DAYS

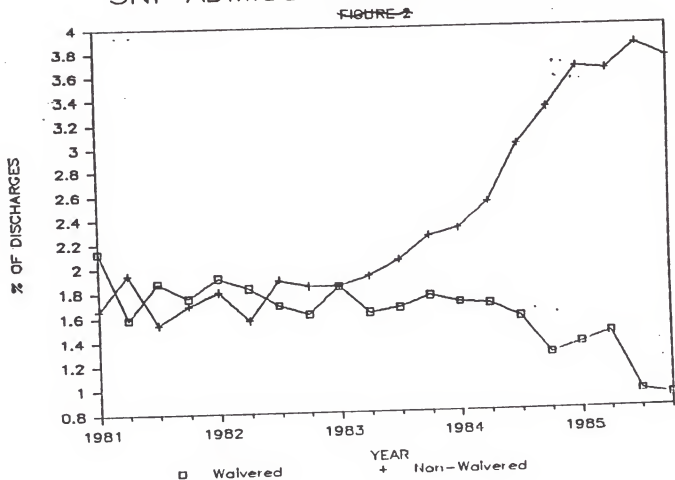
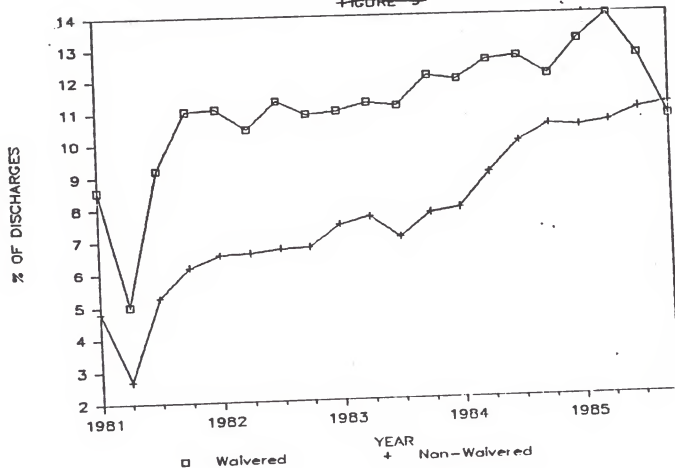




Figure 5.3

# HHA VISITS WITHIN 7 DAYS

~~FIGURE 3~~



### Medicare Net Income

Trends in Medicare net income for hospitals under PPS are shown in Table 3.11. These data are from the Medicare cost reports submitted by 4,296 hospitals for their first and second cost reporting periods under PPS. This group of hospitals was chosen on the basis of the availability of cost reports for both years, subject to several editing checks to eliminate cost reports with apparently miscoded or otherwise inconsistent data. The sample is thus not necessarily representative of the universe of Medicare hospitals, but it does include more than 75 percent of the hospitals currently paid under PPS.

Payments per case include the basic PPS payments due to the hospital (assuming that all deductible and coinsurance payments are collected), outlier and indirect medical education payments under PPS, and payments for capital and direct medical education costs. Costs per case include all routine inpatient care costs, plus capital and direct medical education costs. These data are case-weighted--that is, payments and costs are summed over all hospitals in each group and then divided by the total number of PPS discharges for hospitals in that group.

Medicare net income is simply the difference between Medicare payments and costs per case. Previously, percentage Medicare net income had been calculated by dividing Medicare net income by Medicare costs per case. In this report, in order to correspond more closely to the accounting practices commonly used by hospitals, percentage Medicare net income is calculated by dividing Medicare net income by Medicare payments per case.

Table 3.11

MEDICARE HOSPITAL PAYMENTS, COSTS, AND NET INCOME  
FIRST AND SECOND YEARS UNDER PPS

Hospital Group	First PPS Year			Second PPS Year		
	Payments Per Case <sup>a</sup>	Costs Per Case <sup>a</sup>	Net Income <sup>b</sup> Per Case	Payments Per Case <sup>a</sup>	Costs Per Case <sup>a</sup>	Net Income <sup>b</sup> Per Case
All hospitals	\$ 3,911	\$ 3,393	\$ 518 (13.3%)	\$ 4,343	\$ 3,792	\$ 550 (12.7%)
Urban	4,448	3,809	639 (14.4)	4,950	4,277	672 (13.6)
o <100 beds	3,347	2,914	433 (12.9)	3,773	3,327	445 (11.8)
o 100-404 beds	4,257	3,674	582 (13.7)	4,886	4,109	577 (12.3)
o 405-684 beds	4,915	4,174	741 (15.1)	5,547	4,687	860 (15.5)
o 685+ beds	5,561	4,567	994 (17.9)	6,281	5,215	1,066 (17.0)
Rural	2,404	2,225	179 ( 7.5)	2,618	2,414	204 ( 7.8)
o <100 beds	2,148	1,985	163 ( 7.6)	2,316	2,165	151 ( 6.5)
o 100-169 beds	2,535	2,340	195 ( 7.7)	2,816	2,602	214 ( 7.6)
o 170+ beds	2,785	2,591	194 ( 7.0)	2,984	2,685	299 (10.0)
New England	4,056	3,574	482 (11.9)	4,671	4,066	605 (13.0)
Mid-Atlantic	4,469	3,822	648 (14.5)	4,899	4,218	681 (13.9)
South Atlantic	3,552	3,137	415 (11.7)	3,977	3,523	454 (11.4)
E. No. Central	4,216	3,656	559 (13.3)	4,638	4,040	599 (12.9)
E. So. Central	3,042	2,762	280 ( 9.2)	3,353	2,949	404 (12.1)
W. No. Central	3,655	3,110	545 (14.9)	4,040	3,464	576 (14.3)
W. So. Central	3,446	2,933	513 (14.9)	3,870	3,413	457 (11.8)
Mountain	3,825	3,356	468 (12.2)	4,248	3,621	627 (14.8)
Pacific	4,946	4,230	716 (14.5)	5,454	4,773	681 (12.5)
Major Teaching	6,991	5,806	1,185 (16.9)	7,877	6,438	1,439 (18.3)
Other Teaching	4,699	4,003	696 (14.8)	5,232	4,481	751 (14.4)
Non-Teaching	3,308	2,924	384 (11.6)	3,643	3,257	385 (10.6)
Not-for-Profit	4,114	3,546	568 (13.8)	4,549	3,948	601 (13.2)
Proprietary	3,743	3,281	462 (12.4)	4,185	3,734	451 (10.8)
Government	3,119	2,783	336 (10.8)	3,503	3,110	550 (12.7)

<sup>a</sup>Payments and costs per case include capital and direct medical education costs, which are reimbursed on a reasonable-cost basis under PPS.

<sup>b</sup>Percentage net income is defined as net income as a percentage of payments.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

In the first PPS year, Medicare net income per case was \$518. In the second year under PPS, it rose slightly, to \$550 per case, although there was a slight decrease in net income as a percentage of payments (from 13.3 percent to 12.7 percent). Preliminary data from cost reports submitted for hospitals' their third year under PPS indicate a steep decline in Medicare net income; the set of hospitals for which third-year data are available is much smaller, however, and not representative of the entire set of PPS hospitals.

Urban hospitals had much higher Medicare net income percentages than did rural hospitals in the first PPS year (14.4 percent versus 7.5 percent), and the discrepancy between the two groups appears to have narrowed in the second PPS year, but only slightly (to 13.6 percent versus 7.8 percent). Medicare net income was positively related to hospital size in both years, and the relationship became stronger in the second year. There was a substantial increase in the Medicare net income of the largest rural hospitals in the second PPS year, due perhaps to the enormous increase in the number of regional referral centers (from 6 in FY 1984 to 158 in FY 1985), most of which are large rural hospitals.

Aggregate Medicare net income percentages were above 10 percent in all nine census divisions for the second year under PPS, with the Mountain region (14.8 percent) having the highest and the South Atlantic (11.4 percent) the lowest. There were some large changes between the 2 years in some census divisions, with the East South Central and Mountain regions having the largest increases (2.9 and 2.5 percentage points, respectively), and the West South Central and Pacific regions having the largest decreases (3.1 and 2.0 percentage points, respectively) from the first PPS year to the second.

Major teaching hospitals had very high Medicare net incomes in both absolute (\$1,189) and percentage (16.9 percent) terms in the first PPS year, and this trend became even more marked in the second PPS year, during which their aggregate Medicare net income (\$1,439, or 18.3 percent) was more than two and one-half times the national average. Other teaching hospitals had about the same Medicare percentage net income in each of the first 2 years under PPS (14.8 and 14.4 percent, respectively), while nonteaching hospitals had a slight decrease in Medicare percentage net income (from 11.6 to 10.6 percent).

The distribution of financial effects in the first 2 years under PPS is shown in Table 3.12. The percentage of hospitals that had positive Medicare net incomes in the first PPS year was very high (83.1 percent), but fell slightly (to 79.2 percent) in the second year. The distribution of hospitals with Medicare losses across hospital groups generally reflected the aggregate averages, with urban hospitals faring better than rural hospitals (11.8 of urban hospitals had Medicare net losses, compared with 29.9 percent of rural hospitals), large hospitals better than small hospitals (none of the largest urban hospitals had Medicare net losses, compared with 32.2 percent of the smallest rural hospitals), and teaching hospitals faring better than nonteaching hospitals (1.9 percent of major teaching hospitals had Medicare net losses, compared with 23.5 percent of nonteaching hospitals).

Table 3.13 shows the pattern of changes in hospitals' financial status in the second PPS year compared to the first year. This table shows that 72.3 percent of the 4,296 hospitals in the sample had positive Medicare net incomes in both years, while only 10 percent had Medicare losses in both years. Of the hospitals that had Medicare losses in the first year (16.9 percent), about four out of ten (6.9 percent of the sample) had positive

Table 3.12

PERCENT DISTRIBUTION OF HOSPITALS  
BY MEDICARE PERCENTAGE NET INCOME<sup>a</sup>  
FIRST AND SECOND YEARS UNDER PPS

Hospital Group	First PPS Year				Second PPS Year			
	Pct. Less Than: -15%	0	Pct. Greater Than: 0	15%	Pct. Less Than: -15%	0	Pct. Greater Than: 0	15%
All hospitals	3.8	16.9	83.1	30.3	5.8	20.8	79.2	29.3
Urban	1.7	8.1	91.9	40.3	2.7	11.8	88.2	37.3
o <100 beds	4.8	16.1	83.9	38.3	8.2	21.3	78.7	40.2
o 100-404 beds	0.8	6.5	93.5	39.4	1.2	10.2	89.8	33.7
o 405-684 beds	0.0	1.9	98.1	45.6	0.0	2.3	97.7	46.7
o 685+ beds	0.0	0.0	100.0	62.5	0.0	0.0	100.0	55.0
Rural	6.0	25.7	74.3	20.2	8.9	29.9	70.2	21.2
o <100 beds	7.5	28.2	71.8	22.4	11.0	32.2	67.8	22.2
o 100-169 beds	1.2	18.1	81.9	14.0	1.8	22.6	77.5	14.8
o 170+ beds	0.6	15.4	84.6	11.5	1.3	21.2	78.9	24.4
New England	0.0	8.6	91.4	26.9	1.1	8.6	91.4	28.0
Mid-Atlantic	1.6	5.9	94.1	44.9	2.1	8.0	92.0	38.5
South Atlantic	2.2	16.2	83.8	25.2	3.3	18.0	82.1	25.4
E. No. Central	1.2	11.5	88.5	27.8	3.7	16.6	83.4	31.0
E. So. Central	3.6	19.8	80.2	19.6	2.4	17.9	82.1	27.8
W. No. Central	4.8	21.1	78.9	29.4	6.8	25.5	74.5	26.5
W. So. Central	6.9	21.2	78.8	34.7	12.7	31.0	69.0	28.3
Mountain	8.2	24.6	75.4	27.3	9.0	26.2	73.8	32.0
Pacific	3.6	13.7	86.3	40.3	4.5	17.0	83.0	33.0
Major Teaching	0.9	3.7	96.3	62.6	0.0	1.9	98.1	69.1
Other Teaching	0.8	4.9	95.2	42.3	1.1	8.7	91.3	39.9
Non-Teaching	4.4	19.4	80.6	27.3	6.8	23.5	76.6	26.2
Not-for-Profit	2.6	13.8	86.2	32.1	4.5	17.7	82.3	30.8
Proprietary	2.5	15.8	84.2	35.0	5.5	20.7	79.3	27.4
Government	7.5	24.5	75.5	23.6	8.9	27.7	72.3	26.8

<sup>a</sup>Net income includes capital and direct medical education costs and payments.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 3.13

DISTRIBUTION OF HOSPITALS BY POSITIVE AND NEGATIVE MEDICARE NET INCOMES<sup>a</sup>  
IN FIRST AND SECOND YEARS OF PPS

<u>Hospital Group</u>	Percent <u>Neg. PPS-1</u> <u>Neg. PPS-2</u>	Percent <u>Neg. PPS-1</u> <u>Pos. PPS-2</u>	Percent <u>Pos. PPS-1</u> <u>Neg. PPS-2</u>	Percent <u>Pos. PPS-1</u> <u>Pos. PPS-2</u>
All hospitals	10.0	6.9	10.8	72.3
Urban	4.4	3.7	7.3	84.5
o <100 beds	10.3	5.8	10.9	73.0
o 100-404 beds	3.1	3.4	7.2	86.4
o 405-684 beds	0.0	1.9	2.3	95.8
o 685+ beds	0.0	0.0	0.0	100.0
Rural	15.5	10.2	14.3	60.0
o <100 beds	17.6	10.7	14.6	57.2
o 100-169 beds	9.5	8.6	13.1	68.8
o 170+ beds	7.1	8.3	14.1	70.5
New England	4.3	4.3	4.3	87.1
Mid-Atlantic	4.3	1.6	3.7	90.4
South Atlantic	8.8	7.4	9.1	74.7
E. No. Central	5.8	5.7	10.8	77.7
E. So. Central	8.7	11.1	9.2	71.0
W. No. Central	13.0	8.1	12.5	66.4
W. So. Central	14.4	6.8	16.6	62.2
Mountain	16.0	8.6	10.2	65.2
Pacific	8.5	5.2	8.5	77.8
Major Teaching	0.9	2.8	0.9	95.3
Other Teaching	2.4	2.4	6.3	88.9
Non-Teaching	11.5	7.8	11.9	68.7
Not-for-Profit	7.9	5.9	9.8	76.4
Proprietary	9.2	6.7	11.6	72.6
Government	15.1	9.4	12.6	62.9

<sup>a</sup>Net income includes capital and direct medical education costs and payments.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Medicare net incomes in the second year; of the hospitals with positive net incomes in the first year (73.1 percent of the sample), only slightly more than one out of eight had losses in the second year (10.8 percent of the sample).

### Overall Profitability

The data on Medicare net income presented above describe the immediate impact of PPS on hospital financial status. Obviously, the effect of Medicare prospective payment would be reflected most directly in changes in Medicare net income. However, it has been asserted that Medicare net income cannot be accurately measured, because true Medicare costs are not directly represented in the Medicare cost reports. Routine and special care accommodations costs for Medicare patients are prorated from total routine and special care costs (on the basis of Medicare days as a proportion of total days), and thus may understate (or overstate) the true costs of treating Medicare patients.

Data on the overall financial status of hospitals are important because they describe both the "bottom line" that to a great extent defines the environment in which hospitals develop their reactions to the incentives provided by PPS and the overall performance of an industry that still accounts for the bulk of the health care provided to Medicare enrollees.

Overall financial status was examined by Hendricks (1987) on the basis of 3,224 short-term, acute-care hospitals reporting profit data for both their TEFRA year and their first PPS year. These represent about 62 percent of all non-Federal, short-term, acute-care, Medicare-eligible hospitals in the United States, excluding the four original non-PPS States. Data are based on the Medicare cost reports and AHA panel surveys.



The measures used to describe overall hospital financial status are total margin, which is equal to total revenues less total costs divided by total revenues, and operating margin, which is equal to patient revenues less total costs divided by patient revenues. Total revenues and total costs include revenues and costs generated by the treatment of patients and all other institution-wide revenues and costs. Thus, total margin describes the overall financial status of the institution, rather than the profits or losses directly generated by patient care. Operating margin does not describe the profits and losses generated by patient care, either, because it compares patient revenues with total costs; rather, it reflects the importance of nonpatient generated revenues (i.e., total revenues less patient revenues) to the hospital.

U.S. hospitals had their highest recorded profits in the first PPS year, the nationwide average total margin increasing to 7.9 percent from 3.7 percent in the TEFRA year (see Table 3.14). The average operating margin in the first year of PPS was 2.6 percent, compared to -1.1 percent under TEFRA.

Translating these percentages into dollar amounts, average total margins increased from \$655,000 in the TEFRA year to almost \$1.5 million in the first PPS year--an increase of about \$800,000 per hospital. The average operating margin increased from -\$186,000 to \$454,000, or about \$640,000 per hospital. This indicates that about 80 percent of the increase in total margin was accounted for by an increase in patient revenue, and about 20 percent was accounted for by other revenue sources.

This improvement in financial status was not evenly distributed, however, (see Table 3.15). In the TEFRA year, almost one-quarter of the hospitals in the sample had negative total margins, with more than one in 20 having losses of 10 percent or more. In the first year of PPS, there was general

Table 3.14

HOSPITAL OPERATING AND TOTAL MARGINS  
TEFRA YEAR VERSUS FIRST PPS YEAR

	<u>Rate</u>	Dollars Per Hospital <u>(000s)</u>
Operating Margin:		
TEFRA	- 1.1%	-\$ 186
PPS-1	2.6	454
Total Margin:		
TEFRA	3.7	655
PPS-1	7.9	1,455

---

Source: Hendricks (1987).

Table 3.15

FREQUENCY DISTRIBUTION OF OPERATING AND TOTAL MARGINS  
TEFRA YEAR VERSUS FIRST YEAR OF PPS

	<u>Operating Margin</u>		<u>Total Margin</u>	
	<u>TEFRA</u>	<u>PPS-1</u>	<u>TEFRA</u>	<u>PPS-1</u>
Mean:	-1.1%	2.6%	3.7%	7.9%
Std. Deviation:	13.9	17.5	11.4	13.9
Bottom 5%:	-21.9	-23.9	-11.4	- 9.6
10%:	-13.1	-13.0	- 5.4	- 4.2
25%:	- 4.9	- 3.4	0.2	1.6
50%:	- 0.1	2.5	3.8	6.6
75%:	3.8	8.3	7.6	12.2
90%:	9.2	21.4	12.4	23.4
95%:	17.7	32.1	19.8	33.3

NOTE: Means are unweighted, and figures are based only on hospitals reporting components of both total and operating margins for both years.

Source: Hendricks (1987).

improvement in financial status, but the gap between the bottom and top of the distribution widened considerably. In the TEFRA year, 5 percent of the hospitals in the sample had total margins exceeding 19.8 percent; in the first PPS year, the same proportion of hospitals had total margins of 33.3 percent or greater. These shifts in the distributions of operating and total margins are summarized in Figure 3.3, showing marked shifts upward in the first year of PPS compared to the TEFRA year.

Some characteristics and operating data of hospitals at the top and bottom of the distribution of operating margins in the first PPS year are shown in Table 3.16. The top quartile had an average operating margin of 21.9 percent and an average total margin of 23.7 percent in the first PPS year. This compares to 3.9 and 6.9 percent, respectively, for these same hospitals in the TEFRA year, indicating that the hospitals with the largest margins in the first PPS year apparently had not all been similarly successful in the TEFRA year. In fact, over 25 percent of these hospitals had negative operating margins and over 10 percent had negative total margins in the year prior to PPS.

The bottom quartile of hospitals in Table 3.16 had an average operating margin of -16.5 percent (compared to -9.2 percent in the TEFRA year) and an average total margin of -4.7 percent (compared to 0.2 percent in the TEFRA year). Thus, the hospitals that fared worst during the first year of PPS were generally not doing well under TEFRA, either. Over 75 percent of these hospitals had negative operating margins and well over 25 percent also had negative total margins under TEFRA.

Comparing the characteristics of the hospitals in the top and bottom quartiles in Table 3.16 indicates that hospitals in the top quartile were larger than those in the bottom quartile and had somewhat higher occupancy

Figure 33  
HOSPITAL OPERATING MARGINS  
AND TOTAL MARGINS UNDER  
TEFRA VS. PPS-I

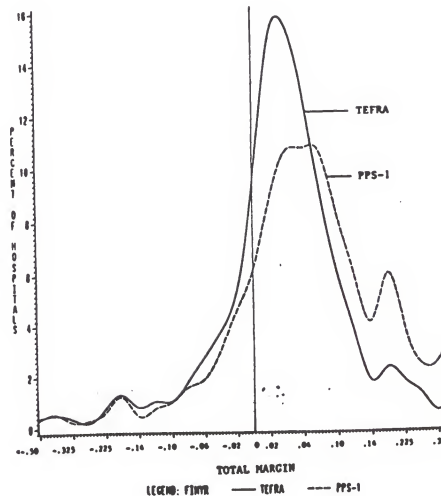
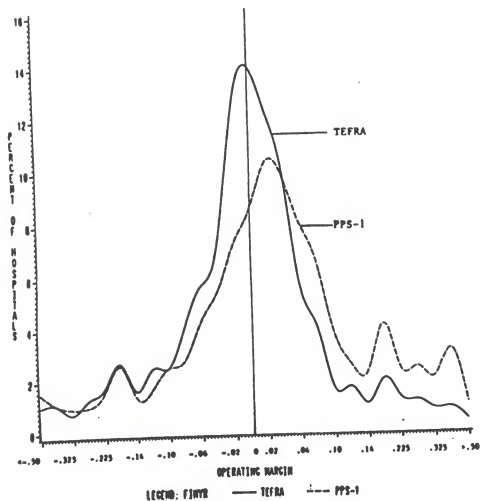


Table 3.16

DESCRIPTION OF TOP AND BOTTOM QUANTILES OF HOSPITALS  
IN TERMS OF OPERATING MARGINS UNDER PPS

	Top Quartile ( <u>&gt;8.3% in PPS-1</u> )		Bottom Quartile ( <u>&lt;-0.034 in PPS-1</u> )	
	<u>TEFRA</u>	<u>PPS-1</u>	<u>TEFRA</u>	<u>PPS-1</u>
Mean:				
o Operating Margin	3.9%	22.0%	-9.2%	-16.5%
o Total Margin	6.9%	23.7%	0.2%	-4.7%
o Number of Beds	168	158	84	81
o Occupancy Rate	60.1%	53.5%	46.7%	38.8%
o Change in Discharges		-3.7%		-9.2%
Percent:				
o Urban		50		26
o Voluntary		51		41
o Proprietary		24		10
o Local Government		25		50
o Nonteaching		86		93
o Sole Community Hospitals		4		12
o Regional Referral Centers		5		1
o Disporportionate Share Hospitals		20		15

---

Source: Hendricks (1987).

rates. Both groups experienced declines in volume under PPS, but the bottom quartile had more than twice as large a decline in percentage terms. There also was a much higher percentage of urban than rural hospitals among those in the top quartile, as well as a higher percentage of proprietary hospitals and regional referral centers. There was a higher percentage of sole community hospitals among those in the bottom quartile, as well as a higher percentage of hospitals owned by State and local governments.

Both urban and rural hospitals fared better, on average, in the first PPS year than in the TEFRA year (see Table 3.17). Urban total margins improved from 4.8 percent to 8.7 percent, an increase of about \$1.36 million per hospital. Rural total margins were lower than those for urban hospitals but they also improved, from 2.8 percent in the TEFRA year to 7.2 percent in the first PPS year, an increase of \$295,000 per hospital. The smaller absolute increase reflects the fact that the average urban hospital is much larger and has much higher costs and revenues than the average rural hospital. Both urban and rural hospitals receive significant revenue from donations, subsidies, and other sources other than patient care, but these funds appear to be more vital to rural hospitals, accounting for the difference between an average 0.5 percent operating margin and a 7.2 percent total margin in the first PPS year.

As was the case for Medicare net revenue, both operating and total margins are related to hospital size. The smallest hospitals in both urban and rural areas had the lowest average total margins in both the TEFRA year and the first PPS year. This contradicts an assertion made at the outset of PPS that small urban hospitals might make large profits because of the higher urban PPS rate and wage indexes. Hospitals in all size groups--including the smallest rural hospitals--had positive total margins in the first PPS year, however.

Table 3.17

OPERATING AND TOTAL MARGINS BY HOSPITAL CHARACTERISTICS  
TEFRA YEAR AND FIRST PPS YEAR

	Operating Margin		Dollars (000s)		Total Margin		Dollars (000s)	
	TEFRA	PPS-1	TEFRA	PPS-1	TEFRA	PPS-1	TEFRA	PPS-1
URBAN	1.4%	5.3%	\$ 421	\$1,660	4.8%	8.7%	\$1,512	\$2,872
RURAL	- 3.1	0.5	- 193	31	2.8	7.2	183	478
URBAN BY SIZE								
o Under 100 beds	- 1.3	1.1	- 83	72	2.7	4.9	179	338
o 100-199 beds	2.1	6.5	358	1,157	5.0	9.6	884	1,789
o 200-299 beds	2.2	7.4	715	2,482	5.0	10.4	1,691	3,652
o 300-404 beds	2.7	5.2	1,235	2,546	6.4	9.2	3,070	4,765
o 404-504 beds	2.8	6.2	1,639	4,137	6.3	10.2	4,208	7,214
o Over 504 beds	0.9	7.1	866	6,927	5.9	10.9	6,019	11,311
RURAL BY SIZE								
o Under 50 beds	- 6.4	- 5.2	- 132	- 108	1.8	4.6	40	103
o 50-99 beds	- 1.2	4.1	- 91	221	2.7	8.6	150	488
o 100-169 beds	1.6	6.5	184	772	4.9	9.9	587	1,228
o Over 169 beds	1.1	7.6	260	1,769	5.2	11.2	1,296	2,755
URBAN BY OWNERSHIP								
o Voluntary	0.9	5.3	316	1,932	4.3	8.6	1,580	3,304
o Proprietary	6.0	8.9	1,052	1,644	6.7	9.6	1,197	1,806
o Nonfed. Govt.	- 3.4	0.2	- 828	51	4.2	8.0	1,117	2,249
RURAL BY OWNERSHIP								
o Voluntary	- 8.5	2.4	- 656	185	3.3	7.0	267	569
o Proprietary	1.4	5.4	107	432	3.8	7.4	298	606
o Nonfed. Govt.	- 6.3	- 2.4	- 281	- 108	2.2	7.3	104	352
URBAN BY REGION								
o Northeast	1.4	12.0	457	3,897	4.1	13.3	1,396	4,530
o South	0.7	3.8	236	1,352	4.4	7.4	1,562	2,770
o North Central	1.8	5.4	482	1,492	5.0	9.4	1,407	2,756
o West	2.6	4.3	615	1,086	5.9	8.0	1,452	2,124
RURAL BY REGION								
o Northeast	- 0.8	14.9	- 127	2,065	3.2	16.8	539	2,504
o South	- 2.5	2.0	- 210	171	1.8	6.5	158	584
o North Central	- 3.3	0.4	- 153	19	3.1	7.9	151	391
o West	- 4.5	- 5.5	- 258	- 326	3.9	4.0	235	250



Table 3.17

OPERATING AND TOTAL MARGINS BY HOSPITAL CHARACTERISTICS  
TEFRA YEAR AND FIRST PPS YEAR  
 (cont.)

	Operating Margin		Dollars (000s)		Total Margin		Dollars (000s)	
	TEFRA	PPS-1	TEFRA	PPS-1	TEFRA	PPS-1	TEFRA	PPS-1
URBAN BY VOLUME TRENDS								
o Gained Inpatients	- 0.2%	7.0%	-\$ 63	\$2,346	3.8%	10.6%	\$1,275	\$3,774
o Lost Inpatients	2.1	4.6	616	1,395	5.2	7.9	1,590	2,515
RURAL BY VOLUME TRENDS								
o Gained Inpatients	- 5.0	1.7	- 310	112	1.7	8.7	111	607
o Lost Inpatients	- 2.5	0.1	- 156	6	3.2	6.7	210	438
URBAN BY OCCUPANCY RATE								
o Less Than 25%	-13.8	-12.1	- 998	- 898	- 7.8	-10.4	- 594	- 812
o 25-50%	1.4	2.6	176	329	4.2	5.9	544	775
o 50-75%	1.9	7.1	646	2,495	5.1	10.4	1,816	3,854
o 75-100%	2.2	6.7	1,189	3,918	6.8	11.0	3,892	6,816
RURAL BY OCCUPANCY RATE								
o Less Than 25%	- 9.5	-14.5	- 167	- 243	0.4	- 0.7	7	- 13
o 25-50%	- 4.0	- 0.1	- 166	- 4	2.5	6.9	109	301
o 50-75%	0.4	6.4	43	702	4.3	10.2	487	1,175
o 75-100%	0.4	6.4	595	1,006	4.5	9.5	702	1,566
URBAN BY LOCATION								
o Core City	1.8	5.5	701	2,402	5.1	9.2	2,091	3,937
o Suburban Ring	1.0	5.1	202	1,080	4.5	8.4	944	1,860
RURAL BY LOCATION								
o Adjacent to MSA	- 2.9	- 0.1	- 199	- 7	2.7	6.0	194	436
o Not Adjacent to MSA	- 3.3	1.2	- 188	69	3.0	8.3	179	506

Source: Hendricks (1987).

Proprietary hospitals had substantially higher operating margins than other hospitals in both the TEFRA year and the PPS year, although their total margins (i.e., taking into account nonpatient revenues) are only slightly higher than voluntary and (State and local) government hospitals. The financial status of government hospitals in both urban and rural areas appear to have improved in the first PPS year, with their average total margins increasing by 3.8 and 5.1 percentage points, respectively.

Most hospitals (almost 75 percent of the sample represented in Table 3.17), both urban and rural, experienced decreases in inpatient volume during this time period--a trend that appears strongly related to financial status. Hospitals that did not have a decline in volume, whether in urban or in rural areas, had higher total margins than those that did. The hospitals with increased volume had lower total margins in the TEFRA year, on average, but had higher total margins in the first PPS year.

Hospitals with extremely low occupancy rates (under 25 percent) in the TEFRA year experienced losses in both the TEFRA year and the first PPS year and, in fact, tended to have somewhat lower margins in the first year of PPS than in the TEFRA year--perhaps because they experienced even further drops in occupancy under PPS.

Finally, hospitals in the core city of an urban area had about the same average total margin as hospitals in the suburban ring, but rural hospitals in counties adjacent to urban areas had marginally lower margins than their more isolated rural counterparts. This may reflect the "border problem" of PPS rates tending to drop off more sharply than input costs in areas adjacent to urban areas.

The data described above provide an indication of the early effect of PPS on some aspects of the distribution of overall hospital profits. More recent

data indicate that the level of hospital profits may not continue at the high levels observed in the early post-PPS period. Whether the overall trend has any effect on the distribution of hospital profits will be the subject of continuing research.

### Hospital Management and Cost Control

The trends in hospital utilization, intensity of care, patient management, and financial status described so far may be viewed as the outcomes of changes in the environment in which hospitals function--due both to changes in the Medicare program and to initiatives being undertaken by other public and private payers for health care. They reveal relatively little, however, about the kinds of management responses that have produced these outcomes.

To find out more about the ways in which administrators have responded to the new PPS incentives--whether they are managing more efficiently and, if so, how they have managed to reduce costs--HCFA funded a series of case studies that included visits to and analyses of ten different areas nationwide. Hospital administrators in more than 60 hospitals were interviewed on a broad range of activities covering several areas of cost management, including:

- o Structural alterations in the physical plant;
- o Employment and wage changes;
- o Nonlabor cost savings; and
- o Organizational and management improvements.

Table 3.18

EXAMPLES OF COST COMPETITIVE ACTIVITIES AMONG PPS HOSPITALSSTRUCTURAL CHANGES

- |                                |                                    |
|--------------------------------|------------------------------------|
| o Eliminating Beds             | o Closing Clinics                  |
| o Converting Inpatient beds to | o Downscaling nursing units        |
| - Swing beds                   | o Closing operating rooms          |
| - Rehabilitation beds          | o Installing energy-saving systems |
| - Psychiatric beds             |                                    |
| - SNF/ICF beds                 |                                    |
| - Sub-acute monitoring units   |                                    |
| - Dialysis                     |                                    |
| - Outpatient surgery           |                                    |
| - Office space                 |                                    |
| - Ambulatory testing           |                                    |
| - Hotel floor for relatives    |                                    |

LABOR CHANGES

- |  |                                       |
|--|---------------------------------------|
| o Layoffs (with emphasis on attrition)         | o Substitution of RNs for LPNs        |
| o Early retirement programs                    | o Adopting nursing acuity systems     |
| o Emphasis on part-time and contract employees | o Primary care nursing                |
| o Shift employees to outpatient department     | o Forming surgical nursing department |
| o Variable staffing                            | o Performance contracting             |
| o Non-guaranteed work week                     | o Frozen wages                        |
|  | o CPI-constrained wage increases      |
|  | o Merit wage program                  |
|  | o No automatic CPI or merit raises    |
|  | o Fewer management perquisites        |

NON-LABOR CHANGES

- |  |  |
|--|--|
| o Group purchasing                         | o Mini-pharmacy on nursing units       |
| o Health care and liability self insurance | o Smaller drug inventories             |
| o Computerization of                       | o Generics, formularies for drugs      |
| - inventory                                | o Multiple bids on supplies, equipment |
| - pharmaceuticals                          | o Less expensive prostheses            |
| - accounting, MIS, budgets                 | o Better equipment maintenance         |
| - ECGs, ancillary orders                   |  |
| - medical records                          |  |
| - nurse scheduling                         |  |
| - patient diets                            |  |
| - operating room schedules                 |  |

Table 3.18

EXAMPLES OF COST COMPETITIVE ACTIVITIES AMONG PPS HOSPITALS  
(cont.)

ORGANIZATIONAL CHANGES

- |                                    |                                 |
|------------------------------------|---------------------------------|
| o Upgrading administration         | o Reorganizing nursing under    |
| o Management contracts for         | program directors (e.g., heart, |
| small hospitals                    | OB/GYN)                         |
| o Hospital mergers to spread       | o More weekend surgeries        |
| overhead costs                     | o More pre-admissions testing   |
| o Discouraging competition among   | o Morning admission for surgery |
| facilities within organization     |                                 |
| o Sharing expensive technologies   |                                 |
| (e.g., MRI)                        |                                 |
| o Inter-hospital personnel sharing |                                 |
| o Managing budgets by intensity    |                                 |
| per case                           |                                 |

---

Source: Cromwell (1987).

Although many of the activities that were being undertaken in these areas had been planned or begun before PPS, administrators attributed a strong supporting role to the change in Medicare's payment system (Cromwell, 1987). The range of activities reported by hospital administrators is highlighted in Table 3.18.

As described above, many hospitals have experienced large declines in inpatient days and occupancy rates. Administrators reported that they have responded to these declines by closing beds entirely or converting them to other revenue-producing uses, such as rehabilitation or psychiatric beds and hotel floors for overnight visiting relatives. There appears to be a strong trend toward expansion of outpatient surgical facilities--often by directly converting inpatient beds and nursing stations. Many hospitals reported downscaling nursing units and adding more substations to increase nursing productivity. Closure of operating suites or their conversion to outpatient surgical facilities was commonly reported as a response to falling inpatient volumes. A few hospitals also reported closing off-site clinics that were increasingly underutilized. Some hospitals reported adoption of energy-saving systems to conserve on rising energy costs.

While bed closures and conversions are a more visible manifestation of hospitals' responses to PPS, changing employment policies may have had a greater short-run cost impact. Almost all of the hospitals that were observed reported cutbacks in full-time staff. This has been accomplished gradually through attrition where possible, but volumes are down so much in many hospitals that layoffs of 30 percent or more have been reported. A rapid expansion in outpatient care has picked up some of the slack left by the decrease in inpatient volume. Several hospitals reported that they have implemented innovative programs to modulate employment swings--including

early retirement bonuses, switching to more part-time or contract workers, and variable staffing. Variations of the "nonguaranteed" work week, wherein employees are offered a higher hourly rate in exchange for the possibility that the work week may be shortened by up to 20 percent, if necessary, were reported by a few hospitals.

Layoffs appear to have occurred primarily among less skilled personnel, resulting in an acceleration in the substitution of registered nurses (RNs) for licensed practical nurses (LPNs). To hospital administrators, the greater job flexibility of RNs and the difficulty in recruiting them were cited as outweighing their higher hourly wages. Some hospitals reported that they have responded to the declining volumes and layoffs by switching from team to primary care nursing, to take advantage of the multiple talents of RNs while giving more personalized care to patients.

The emphasis on nursing productivity has also increased at the case study hospitals, leading to adoption of nursing acuity systems that help to better match nursing needs with changing case mix on particular floors. Rural hospitals, in particular, reported increasing their use of these systems, which were often thought to be unnecessary or too expensive in the past.

Hospital administrators appear to have attempted to soften the employment effects of declining volumes by curtailing wage increases. Those in the most dire financial position reported freezing wages or even, in extreme cases, cutting wages across-the-board to minimize the number of layoffs. Although the majority of hospitals have enjoyed improved financial status under PPS, wage increases were reported as rarely exceeding the cost of living, even when they are attained. In rare instances, hospitals have even reported pursuing new contracts with their hospital-based physicians, based on department performance.

Cost cutting in nonlabor areas is harder to document, but also noteworthy. Most hospital administrators reported that they had engaged in some form of group purchasing before PPS, but that they now give it higher priority. Indeed, the few hospitals without such arrangements thought they were at a distinct competitive disadvantage and reported actively discussing joint purchasing with other hospitals.

Computerization has also apparently become common throughout the industry, first in larger urban hospitals, but increasingly so in smaller rural hospitals as well. Inventories, pharmaceuticals, budgets, ancillary services, diets, medical records, and nursing schedules were reported as becoming increasingly automated. In addition, computerized DRG management information systems were found to be present in almost every case study hospital. Even small rural hospitals reported investing in computer hardware and software to implement variable staffing, to avoid expensive operating room down time, to reduce unnecessary inventories, and to simulate new department budgets in response to rapidly changing volumes.

Broader organizational changes have also been reported. Foremost among these is a rapid turnover in hospital administration. As the industry moves into a new world of fixed rate versus cost-based payment, more aggressive utilization and quality review, and competition to attract both patients and admitting physicians, hospital boards have been reported as moving quickly to recruit new administrators and medical staff managers that have been trained to place more emphasis on efficiency. New leadership was most often reported in smaller rural hospitals that have experienced the greatest decreases in volume. Hospitals that could not afford to hire a new management staff on a full-time basis frequently reported having signed management contracts with other local hospitals or national chains.



With rapid downscaling of the industry, even in urban areas, consolidations and mergers have become common in the case study sites. Competing smaller hospitals have reported merging to offset the advantages enjoyed by dominant hospital organizations in local markets. Where facilities had already merged prior to FPS, management frequently has been reorganized along functional lines, rather than letting each administrator be completely responsible for his or her own facility. Triaging patients across facilities to minimize joint costs has been found to be beneficial when facilities are no longer being paid individually on a cost basis.

Service sharing among competitors was also reported, but only under certain conditions. On the one hand, very expensive equipment, such as magnetic resonance imagers and lithotripters, may be shared on occasion because of high fixed costs and low volumes for any single facility. On the other hand, hospitals may find that the exclusive ownership of specialized services can play a key role in establishing a competitive edge in attracting patients. When and how hospitals team up to provide a service may be motivated by underlying cost considerations, but service sharing is greatly complicated by the new adversarial position of institutions competing for a decreasing number of inpatients.

Other observed organizational changes relating to patient management included policies encouraging same-morning admissions for surgery, weekend surgery, and more preadmission testing. A few administrators mentioned the subtle reorientation of budgeting away from the department and towards the case. Managers reported the increasing use of an implicit form of matrix budgeting, scrutinizing each department's budget in toto relative to last year's, as well as with respect to intensity per case by DRG. Both steps are seen as necessary for setting a final hospital budget that screens for cost inflation as well as appropriateness of care.

## Hospital Investment and Service Adoption

As was mentioned in Chapter 2, hospitals' capital costs are currently paid on a cost-reimbursement basis. At the time that PPS was implemented, there was much speculation on the effects that the new payment methodology might have on hospital investment, due to apparently conflicting short-run incentives. On the one hand, the fixed payment per case under PPS provided an incentive to avoid any purchases that would increase operating costs in the short run. But, on the other hand, temporary exclusion of capital costs from the PPS fixed rate was thought to encourage higher capital spending--both to substitute for resources no longer reimbursed on a cost basis and in anticipation of future limits on reimbursement for capital spending.

This section presents preliminary descriptive information on hospital investment and adoption of new technology during the TEFRA year and the first year of PPS (from Gaynor, 1987), framed in terms of three questions:

- o Are rates of investment or rates adoption of new technology faster or slower under PPS?
- o Do hospital characteristics influence rates of investment and service adoption?
- o Has PPS slowed the diffusion of complex, expensive equipment into new market areas?

These descriptive data--particularly in the discussion of hospital investment--is intended to serve as a baseline for future analysis.

Two caveats with respect to our ability to answer the questions listed above must be mentioned. The first concerns the nature of investment and the period of time for which data are available. Investment is a long-term activity, for which plans are made and changed slowly. For many types of investment, decisions made in response to PPS will not be translated into expenditure for several years. Moreover, the data available for this analysis have been obtained from Medicare cost reports, which do not reflect the cost of fixed capital projects until they are completed. Therefore, the full effects of PPS on hospital investment will not be evident for several years. The second caveat concerns the fact that this analysis is limited to univariate descriptive statistics. This technique is simple and effective in indicating basic trends, but it does not control for confounding influences. The grouping of hospitals according to characteristics such as size, location, teaching status, and ownership may provide some control for confounding influences, but broader conclusions from this type of analysis should nonetheless be drawn with extreme caution.

#### Hospital Investment

As stated above, the data presented in this section are meant to provide a baseline for future analysis. Since there is a substantial lag between investment decisions and the completion of the resulting projects, it may be several years before the effects of PPS on investment begin to be seen. Even then, it may be difficult to disentangle all of the potential influences on investment behavior. Nonetheless, it is important to begin to examine the relevant data.

Table 3.19

PERCENTAGE CHANGES IN HOSPITAL INVESTMENT MEASURES  
FROM TEFPRA TO FIRST PPS YEAR  
STRATIFIED BY HOSPITAL CHARACTERISTICS

<u>Hospital Group</u>	<u>Pct. Change in Net Fixed Assets</u>	<u>Pct. Change in Number of Beds</u>	<u>Pct. Change in Net Fixed Assets Per Bed</u>
All Hospitals	7.2	-5.2	12.4
Urban Hospitals	8.2	-5.8	14.0
o Under 100 Beds	5.6	-4.1	9.6
o 100-199 Beds	11.4	-4.9	16.3
o 200-299 Beds	7.4	-6.3	13.7
o 300-404 Beds	4.2	-6.0	10.2
o 405-504 Beds	7.4	-5.1	12.5
o Over 504 Beds	12.2	-6.5	18.7
Rural Hospitals	3.9	-3.7	7.6
o Under 50 Beds	1.7	-1.8	3.5
o 50-99 Beds	2.8	-5.3	8.1
o 100-169 Beds	5.8	-2.7	8.5
o Over 169 Beds	4.2	-4.4	8.5
New England	4.9	-2.2	7.1
Middle Atlantic	1.6	-2.6	4.2
East North Central	8.5	-4.0	12.5
West North Central	3.8	-6.2	10.1
South Atlantic	17.9	-6.3	24.2
East South Central	1.7	-8.8	10.7
West South Central	15.8	-5.2	20.9
Mountain	8.6	-3.6	12.2
Pacific	18.9	-6.9	25.8
Major Teaching	-0.4	-8.4	7.9
Other Teaching	9.2	-7.4	16.6
Non-Teaching	7.1	-3.7	10.7
Not-for-Profit	7.2	-5.3	12.4
Investor Owned	13.0	-2.5	15.6
State and Local	5.9	-5.5	11.4

Source: Gaynor (1987).

National rates of investment per hospital for the first year of PPS, stratified by hospital characteristics such as location, size, teaching status, and ownership, are shown in Table 3.19. The nationwide rate of investment in net fixed assets was 7.2 percent during the first PPS year, which was lower than in any of the previous four years. This may suggest that PPS had a dampening effect on hospital investment during its first year, to the extent that it delayed the completion of ongoing capital projects. However, it may also be that the effects of changes that occurred prior to or concurrently with the implementation of PPS were reflected in the lower fixed investment rate during the first PPS year.

Trends in net assets per bed are also relevant to any assessment of hospital investment. Nominal net fixed assets per hospital bed increased by 12.4 percent during the first year of PPS. Since per bed figures may overstate the actual intensity per patient when occupancy is falling, investment per adjusted admission and per adjusted patient day may be more appropriate measures of capital deepening. These figures (not shown in the table) are 12.4 and 13.7 percent, respectively, reinforcing the indication that, although the overall rate of investment may have been slower, net assets per bed increased substantially in the first year of PPS.

The average number of beds per hospital decreased by 5.2 percent from the TEFRY year to the first PPS year. This reduction is consistent with the expected response to the decreased demand faced by hospitals in recent years (and documented above). It also explains a large part of the measured growth in net assets per bed.

The rate of investment was not uniform across groups of hospitals. Net investment in fixed assets by rural hospitals in the first year of PPS, for example, was strikingly low. The nominal rate of investment for these

hospitals was 3.9 percent, compared with 8.2 percent for urban hospitals--or about 0.5 versus 4.8 percent, net of the estimated 3.4 percent general inflation in capital costs. The number of beds also decreased at a slower rate in rural hospitals than in urban hospitals (despite the much larger decrease in occupancy rates at rural hospitals), which means that the discrepancy between urban and rural hospitals in net assets per bed was apparently growing in the first year of PPS.<sup>4</sup>

The net rate of investment in fixed assets for the largest urban hospitals was 12.2 percent. This is a higher rate of investment than for any other hospital size category--and more than seven times as high as that for the smallest rural hospitals, whose nominal investment rate of 1.7 percent translates to -1.7 percent in inflation-adjusted terms.

The rate of investment and the rate of investment per bed also differ by teaching status, being higher for minor teaching hospitals than for either major teaching or nonteaching hospitals. Major teaching hospitals were, in fact, measured as having negative net investment (-0.4 percent). It is important to bear in mind, however, that major teaching hospitals have much higher levels of assets to begin with (an average of \$53 million in the TEFRA year compared with just under \$29 million for minor teaching hospitals). The increase in net fixed assets per bed for major teaching hospitals was nearly 8 percent, due to the significant reduction (8.4 percent) in beds at these hospitals.

Proprietary hospitals had the highest rate of net investment in fixed assets (13.0 percent) of any ownership category--more than twice as great in nominal terms as that for non-Federal government hospitals (5.9 percent), and

---

<sup>4</sup>Again, it must be pointed out that these trends do not reflect PPS effects, but only the effects during the first PPS year of decisions made prior to the implementation of PPS.

almost four times as great in real terms (9.6 percent versus 2.5 percent). The rates of increase in fixed assets per bed, however, are closer across ownership categories (15.6 percent for proprietary hospitals, 12.4 percent for not-for-profit hospitals, and 11.4 percent for non-Federal government hospitals).

### Service Adoption

The percentage of hospitals offering each of 10 high-technology services<sup>5</sup> is shown in Table 3.20. These data have been used to construct a service provision index for assessing service adoption under PPS. A score of 100 means that all hospitals in the group offer all ten services. A score of 60 means that the hospitals in the group offer an average of six of the 10 services.

The value of this service provision index increased by 3.6 percent from the TEFRA year to the first PPS year. This increase was not as large as that in the previous year (4.2 percent, not shown in the table), which may reflect a general slowing of the diffusion rate as many technologies approach their maximum diffusion level.

Rural hospitals appear to offer a narrower range of high-technology services (on average, only about 3.6 of the ten included services, compared with 5.2 for urban hospitals in the first PPS year), but their rate of service adoption was actually higher than that for urban hospitals in the first year of PPS (an increase in the index of 4.9 percent versus 2.6

---

<sup>5</sup> Magnetic resonance imaging (MRI), computerized tomography (CT), open-heart surgery, diagnostic ultrasound, cardiac catheterization, neonatal intensive care, megavoltage radiation therapy, organ transplants, diagnostic radioisotope equipment, and cardiac intensive care.

Table 3.20

PERCENTAGE CHANGES IN SERVICE PROVISION INDEX  
FROM TEFRA YEAR TO FIRST PPS YEAR  
STRATIFIED BY VARIOUS HOSPITAL CHARACTERISTICS

<u>Hospital Group</u>	<u>SERVICE PROVISION INDEX</u>		
	<u>TEFRA</u>	<u>PPS</u>	<u>% Change</u>
All Hospitals	41.9	43.4	3.6
Rural Hospitals	34.4	36.1	4.9
o Under 50 Beds	25.6	27.2	6.3
o 50-99 Beds	36.6	38.6	5.5
o 100-169 Beds	46.4	48.3	4.1
o Over 169 Beds	54.9	56.1	2.3
Urban Hospitals	50.5	51.8	2.6
o Under 100 Beds	32.9	34.7	5.5
o 100-199 Beds	46.8	47.6	1.7
o 200-299 Beds	56.3	57.1	1.4
o 300-404 Beds	61.9	63.5	2.6
o 405-504 Beds	67.8	70.0	3.2
o Over 504 Beds	73.3	74.3	1.4
New England	49.9	52.0	4.2
Middle Atlantic	53.4	55.6	4.1
East North Central	41.8	43.3	3.6
West North Central	48.2	49.6	2.9
South Atlantic	39.5	40.0	1.3
East South Central	38.5	40.7	5.4
West South Central	35.4	37.5	5.9
Mountain	37.3	38.7	3.8
Pacific	43.9	44.6	1.6
Major Teaching	68.1	70.2	3.1
Other Teaching	60.4	62.1	2.8
Non-Teaching	38.4	39.8	3.6
Not-for-Profit	47.3	48.9	3.4
Investor Owned	37.0	38.0	2.7
State and Local	34.7	36.2	4.3

Source: Gaynor (1987).



percent). In fact, the smallest rural hospitals showed the highest adoption rates among all size groups--again, perhaps reflecting the lower initial level of diffusion at these hospitals.

Teaching status also appears to be highly correlated with the range of high-technology services offered, with major teaching hospitals having a service provision index almost twice that of nonteaching hospitals (70.2 versus 39.8) in the first year of PPS. Nonteaching hospitals have a higher rate of adoption (3.6 percent, versus 3.1 percent for major teaching hospitals), however.

State and local government hospitals were least likely to offer high-technology services of all ownership categories (with an index of 36.2, compared with 38.0 for investor-owned and 48.9 for not-for-profit hospitals in the first PPS year), but they also had the highest adoption rates (4.3 percent, versus 2.7 percent for investor-owned and 3.4 percent for not-for-profit hospitals).

The percentage of hospitals that offer each of the services included in the service provision index, and how that percentage increased between the TEFRA year and the first PPS year, appear in Table 3.21. The highest rate of change was for MRI, which had the lowest adoption level to begin with. In the base year, only 2.3 percent of hospitals offered MRI. Two years later, 3.6 percent offered that service. Cardiac intensive care, by contrast, had the lowest rate of adoption during the first PPS year, which may be explained by its initially high diffusion level.

Table 3.22 shows the number of MSAs with hospitals owning each of the 10 included high-technology services. During the first year of PPS, there were 17 MSAs without a CT scanner, 59 MSAs with one CT scanner, 72 with two CT scanners, etc. These numbers address the question of whether PPS has affected the diffusion of complex, expensive equipment into new market areas.

TABLE 3.23

TRENDS IN SERVICES OFFERED FROM TEFRA TO PPS YEAR 1

<u>SERVICE</u>	<u>Percent of Hospitals Who Offer Service in PPS Year 1</u>	<u>Percent Change from TEFRA</u>
Magnetic Resonance Imaging (MRI)	3.6	22.6
CT Scanner	49.1	19.3
Open-Heart Surgery	10.7	4.9
Diagnostic Ultrasound	84.3	4.2
Cardiac Catheterization	15.8	3.8
Neonatal Intensive Care	15.6	3.1
Megavoltage Radiation Therapy	14.6	2.2
Organ Transplant	4.6	1.7
Diagnostic Radioisotope	67.5	0.7
Cardiac Intensive Care	77.1	0.4

TABLE 3-22

FREQUENCY OF NUMBER OF MSAs BY THE NUMBER OF SERVICES IN THE MSA

NUMBER OF UNITS IN MSA	MAGNETIC RESONANCE IMAGING (MRI)			CT SCANNER			CARDIAC ICU			DIAGNOSTIC RADIOISOTOPE FACILITY			DIAGNOSTIC ULTRASOUND FACILITY		
	Number of MSA's			Number of MSA's			Number of MSA's			Number of MSA's			Number of MSA's		
	BASE	TEFRA	PPS-1	BASE	TEFRA	PPS-1	BASE	TEFRA	PPS-1	BASE	TEFRA	PPS-1	BASE	TEFRA	PPS-1
0	263	242	224	29	22	17	4	8	5	11	12	10	5	7	5
1	11	27	44	88	69	59	59	48	48	58	49	50	64	54	49
2	3	7	9	69	71	72	56	55	56	66	63	62	55	51	54
3		2	0	30	32	37	48	48	57	35	37	44	35	40	40
4		1	0	10	23	28	24	27	23	32	32	30	30	28	34
5		0	2	10	10	11	20	17	16	16	18	18	20	22	17
6-10		1	1	27	25	28	35	44	41	28	36	31	33	42	45
11-15				10	17	13	17	12	15	17	13	15	20	12	14
16-20				0	6	10	6	9	8	6	7	8	7	9	8
21-30				2	2	2	4	7	6	4	8	7	4	10	9
31+				2	3	3	4	5	5	4	5	5	4	5	5

NUMBER OF UNITS IN MSA	CARDIAC CATHETERIZATION			TRANSPLANT FACILITIES			MEGAVOLT RADIATION THERAPY			NEONATAL ICU			OPEN HEART SURGERY		
	Number of MSA's			Number of MSA's			Number of MSA's			Number of MSA's			Number of MSA's		
	BASE	TEFRA	PPS-1	BASE	TEFRA	PPS-1	BASE	TEFRA	PPS-1	BASE	TEFRA	PPS-1	BASE	TEFRA	PPS-1
0	93	85	80	192	187	184	98	87	84	97	93	81	126	114	110
1	97	96	96	61	64	68	106	113	111	107	112	108	91	93	95
2	34	36	40	14	16	15	31	35	39	36	39	42	23	30	29
3	19	18	19	4	4	5	20	18	18	20	24	24	17	18	21
4	11	15	14	2	5	3	6	8	9	6	6	6	7	8	8
5	7	8	10	3	3	3	4	5	6	5	7	7	5	6	4
6-10	13	18	17	1	1	2	10	10	10	5	7	7	6	9	11
11-15	1	2	2				0	1	1	2	2	1	1	1	1
16+	2	2	2				2	2	2	1	1	2	1	1	1

While the average rate of adoption across hospitals appears to have slowed at the outset of PPS, the diffusion across areas did not. There has been greater deepening of services in MSAs which are already well endowed and continued spreading of high-technology services to new areas.

In general, the number of MSAs having zero units of each of these services has steadily decreased between the base year (FY 1981-82) and the first PPS year. For some services, there were very few MSAs without a single unit (e.g., only 5 of 280 MSAs were without a cardiac intensive care unit) during the base year. But for others, there were many (e.g., 224 of 280 MSAs had no MRI device).

Consider the case of CT scanners. During the base year, 29 MSAs had no CT scanner. By the first year of PPS, only 17 MSAs were without a CT scanner. The same general phenomenon was occurring for most of the other services shown. For example, 126 MSAs did not have open-heart surgery in the base year, compared to 110 in the first year of PPS. In fact, 75 MSAs had at least two open-heart surgery programs by the end of the first year of PPS.

MRI is a particularly noteworthy example, given its expense. The number of MSAs with no MRI units has fallen steadily over time (from 263 to 242 to 224), while the number of MSAs with one or two units almost quadrupled in 2 years. This evidence indicates that PPS has not limited the spread of expensive new technologies across geographic areas, at least during its first year.

#### Summary and Conclusions

The picture presented in this chapter is one of a hospital industry that has undergone tremendous change in recent years. An unprecedented decline in

admissions has been observed for both Medicare and non-Medicare patients. This, combined with the steep decline in average length of stay for Medicare patients as hospitals came under the new system, has resulted in declining inpatient volumes. Despite a decrease in the number of inpatient beds, occupancy rates are at an all-time low, leading to increased competition among hospitals to attract patients. The decline in inpatient volume has not been evenly distributed across hospital types, however; it has been concentrated among small hospitals, putting those hospitals in a particularly disadvantageous position.

The decline in length of stay under PPS has been achieved through shorter stays across-the-board, rather than efforts aimed specifically at patients who have the longest stays (and are, presumably, the most severely ill). The correlation between the financial pressure imposed by PPS and steepness of declines in length of stay provides another indication that PPS has been effective in encouraging hospitals to become more efficient.

The dramatic declines in average length of stay under PPS may be leveling off, however. Among PPS cases only, there has been very little change since the first year of prospective payment. This may reflect an unexpectedly strong initial response to the PPS incentive to shorten lengths of stay. It may also be due to the fact that, since utilization review has diverted many of the less severely ill patients from inpatient to outpatient and other ambulatory care, there has been an increase in the measured severity of illness among those Medicare patients who are admitted to the hospital. Continued analysis is necessary to sort out this issue.

Hospitals have, on average, earned high rates of net income on Medicare patients under PPS. The distribution of these returns is uneven, with urban hospitals faring better than rural hospitals, large hospitals better than

small hospitals, and teaching hospitals better than nonteaching hospitals. Recent changes in the PPS payment rules may have alleviated some of this maldistribution, but the unevenness of the distribution documented here suggests that attempts by the Government to recapture some of these high returns by across-the-board rate reductions must be carefully considered.

Data on hospitals' overall financial performance also indicate that they are faring well. However, the gap between those hospitals that are doing very well and those that are not is becoming wider--mostly due to the increase in total margins at the high end of the range. A comparison of hospitals at the top of the distribution with those at the bottom indicates that urban and proprietary hospitals, as well as regional referral centers, are disproportionately represented among those with large margins, while sole community hospitals are disproportionately represented among those at the lower end of the range.

In response to the rapidly changing environment facing the hospital industry, hospital administrators report undertaking initiatives in several areas in an attempt to control costs and increase the viability of their institutions. These changes include structural changes (such as eliminating and converting beds to more efficient uses), changes in the use of both labor and nonlabor inputs (such as staffing reductions and skill-mix reconfigurations, wage actions, and group purchasing and computerization of inventory), and organizational changes (such as the hiring of more business-oriented managers and the initiation of intra-facility cost-sharing arrangements).

Finally, the overall rate of investment reported in the Medicare cost reports for the first year of PPS indicate a somewhat slower rate of investment in fixed assets. However, these data most likely reflect

investment decisions made several years prior to the implementation of prospective payment. Moreover, the intensity of fixed assets per bed has increased, indicating that the decrease in patient volume has outstripped the effective reduction in the growth of capital stock. The diffusion of new technology does not appear to have been affected by PPS; many services that have not yet reached some critical level of availability have continued to grow, both in terms of the number of areas in which they are available and the number of hospitals in each area in which they are available.

### REFERENCES FOR CHAPTER 3

- American Hospital Association. National Hospital Panel Survey Report. Chicago, Illinois: December 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986.
- Carter, G.M. and Ginsburg, P.B. The Medicare Case Mix Index Increase: Medical Practice Changes, Aging, and DRG Creep. Santa Monica, California: The Rand Corporation, 1985.
- Carter, G.M. and Ginsburg, P.B. "The Medicare Case Mix Index: Preliminary Results for 1985." Unpublished working paper. Santa Monica, California: The Rand Corporation, July 1986.
- Cromwell, J. "Hospital Management and Cost Control." Unpublished working paper. Needham, Massachusetts: Health Economics Research, Inc., May 1987.
- Feder, J., Hadley, J., and Zuckerman, S. "How Did Medicare's Prospective Payment System Affect Hospitals?" Unpublished working paper. Washington, D.C.: Georgetown University School of Medicine, Center for Health Policy Studies, November 1986.
- Gaynor, M. "Investment and Service Adoption Under PPS." Unpublished working paper. Needham, Massachusetts: Health Economics Research, Inc., May 1987.
- Hendricks, A. "Hospital Profits in TEFRA and PPS-1." Unpublished working paper. Needham, Massachusetts: Health Economics Research, Inc., May 1987.
- Kidder, D. "The Impact of PPS on Hospital Costs, Efficiency, and Financial Viability." Unpublished working paper. Cambridge, Massachusetts: Abt Associates, Inc., May 1987.
- Pope, G. "Analysis of Changes in Variation of Length-of-Stay and Cost Per Discharge Among Urban Hospitals." Unpublished working paper. Needham, Massachusetts: Health Economics Research, Inc., May 1987.
- Social Security Administration. Social Security Bulletin, Vol. 50 (August 1987), p. 68.



Chapter 4  
IMPACT ON MEDICARE BENEFICIARIES

Introduction

Overview

Among the major objectives of the Medicare program under the prospective payment system (PPS) are continued access to appropriate health care by Medicare beneficiaries and the maintenance of the quality of care provided to these beneficiaries. Ensuring access and quality are particularly important to certain groups within the Medicare population, such as the disabled, patients with end-stage renal disease (ESRD), the very old, and the aged poor, each of which have certain health and socioeconomic characteristics that may make them particularly vulnerable to the incentives provided by the new payment system. Because these groups are likely to require more intensive (and thus more expensive) care for a given type of inpatient episode, hospitals may tend to view them as potentially more costly to treat than the average patient.

At the same time, certain incentives under PPS may serve to encourage improvements in access and quality (see Chapter 2). The incentive for improved hospital management may result in the increased effectiveness of the care that they provide. The incentive for hospitals to specialize in services and procedures that they provide most efficiently may result in improved outcomes, as found in studies by Riley and Lubitz (1984) and several others. The incentive to eliminate unnecessary services could also result in an improvement in the quality of care--for instance, shorter hospital stays

could reduce the risk of nosocomial infection and other iatrogenic incidents to which the elderly are especially vulnerable.

### Data Sources

The findings in this chapter on beneficiary access and utilization are based on the Medical Provider Analysis and Review (MedPAR) files of the Medicare Statistical System, which are derived from the hospital bills submitted for each Medicare case (see Chapter 2). Much of the analysis on mortality trends and rehospitalization is also based on the MedPAR files, supplemented by mortality data from the National Center for Health Statistics (NCHS).

The data on beneficiary liability were produced by HCFA's Office of the Actuary (OACT) for the 1987 Annual Report of the Medicare Board of Trustees. To a great extent, the data were derived from bills that have passed through the HCFA bill processing system. Because of processing lags, it was necessary for OACT to adjust the aggregate data from the bills to get an estimate of what the reimbursement and liability would have been if all of the bills had been processed. The later years' estimates require the most adjustment and, thus, are somewhat less reliable than the earlier years' estimates. However, since more than a year has passed since 1985, the large majority of the bills would have been processed when these estimates were made. Thus we would expect the data shown here to be quite reliable.

## Chapter Organization

The analysis presented in this chapter is divided into three sections:

- o Beneficiary Access and Utilization;
- o Mortality Trends and Rehospitalization; and
- o Beneficiary Liability.

The chapter focuses first on issues relating to access to hospital services, especially for certain vulnerable subgroups of the population. It also examines changes in hospitalization patterns, especially changes in case mix across diagnosis-related groups (DRGs) and within DRG. Mortality rates are examined for both the total Medicare population at-risk and the hospitalized population. Readmissions and out-of-pocket liability are also covered. The chapter concludes with a summary of the results.

### Beneficiary Access and Utilization

This section presents basic descriptive data on hospitalization rates for the elderly, the disabled, and the ESRD Medicare populations. The variables of interest include the discharge rate (number of discharges per 1,000 enrolled persons), average length of stay, and days of care rate (number of days of care per 1,000 enrolled persons). The data are presented by basic age, sex, and race categories. In addition, analyses are presented on a DRG-specific basis. Details of the methods used in this section can be found in the previous issue of this annual report (U.S. Department of Health and Human Services, 1987).

### Medicare's Aged Population

Table 4.1 shows the age, sex, and race composition of the Medicare aged population in 1985 for the States in which PPS was in effect at that time and for the States that had waivers from participation in the nationwide payment system. The distributions by age, sex, and race are relatively similar in the two sets of States, with males comprising about 40 percent and white persons about 90 percent of the total population. Persons aged 65 to 69 comprise about one-third, persons between 70 and 75 about one-fourth, and those over 75 years of age about two-fifths of the total population. Overall, the waiver States accounted for 16 percent of the total U.S. Medicare aged population in 1985.

Access and Utilization By Age, Sex, and Race. The analysis in the previous annual report indicated that there were major changes in discharge rates and average length of stay in 1984 compared to previous trends. Discharge rates declined (in the PPS States) for the first time since the beginning of Medicare. The lack of a similar decline in the waiver States suggested that this change might be attributed to PPS. Average length of stay also declined--at a rate much greater than the historical trend would indicate. Once again, the much greater decline in the PPS States than in the waiver States strongly suggested that the effect was primarily due to PPS. This analysis showed no evidence of systematic changes in the discharge rate or average length of stay across age, sex, or race categories that would indicate that high risk groups such as the oldest old or minorities were disproportionately affected by PPS.

Table 4-1

Number and percent distribution of aged Medicare beneficiaries in PPS States  
and waiver States by age, sex, and race, U.S., 1985

(numbers in thousands)

Age, sex and race	PPS States		Waiver States	
	Number	Percent	Number	Percent
Total	22,861	100	4,254	100
Age:				
65-69	7,309	32	1,346	32
70-74	6,051	26	1,100	26
75-79	4,385	19	808	19
80-84	2,809	12	535	13
85+	2,307	10	465	11
Sex:				
Male	9,244	40	1,649	39
Female	13,616	60	2,606	61
Race:				
White	20,160	88	3,818	90
Other	2,047	9	327	8

SOURCE: Medicare Enrollment tables, aged beneficiaries. 1985 enrollment was estimated as of April 1, 1985. Counts exclude aged persons with End Stage Renal Disease.

Table 4.2 presents Medicare discharge rates, average lengths of stay, and total days of care rates for the years 1980 through 1985. From 1980 through 1983, the discharge rate in the U.S. increased from 371 per 1,000 to 394 per 1,000, an average annual increase of 2.1 percent. This was a continuation of the trend that had been observed since 1968. In 1984, the discharge rate declined (by 2.9 percent) for the first time since the beginning of Medicare. The discharge rate decreased by 3.5 percent in the PPS States and increased by 1.0 percent in the waiver States. In 1985, the U.S. discharge rate declined to 352 per 1,000, a decrease of 8.8 percent. The decrease was greater in the PPS States (9.6 percent) than in the waiver States (4.6 percent). However, the downward movement in the the waiver States marked the first reversal of the historical trend of increased admissions in these States. The reason for these declines is not known. The fact that it is occurring in States not directly affected by PPS suggests that other factors are at least partially at work. Peer Review Organizations (PROs) in both the PPS and the waiver States are actively engaged in admission screening. In addition, there is the effect of the increasing frequency of ambulatory surgery, particularly lens extractions. From 1983 to 1985, the number of Medicare admissions fell by 880,000. During the same time, inpatient lens extractions fell by 300,000, accounting for over one-third of the total decline in admissions.

There was a very large decline in length of stay during the first year of PPS. Unlike discharge rates, average length of stay had been steadily declining prior to the start of PPS--in fact, since the beginning of the Medicare program. From 1980 through 1983, average length of stay declined from 10.3 days to 9.6 days, an average annual decline of 2.3 percent. In 1984, the decline was 0.9 days, or 11.5 percent. There was a 13.2 percent

Table 4-2

Discharges per 1,000, average length of stay and total days of care per 1,000,  
for aged Medicare beneficiaries in the U.S., PPS States and waiver States,  
1980-85

Year	Discharges per 1,000			Average length of stay			Days of care per 1,000		
	U.S.	PPS	Waiver	U.S.	PPS	Waiver	U.S.	PPS	Waiver
1980	371	380	322	10.3	9.9	12.9	3,804	3,745	4,134
1981	371	382	316	10.1	9.7	12.5	3,733	3,695	3,942
1982	388	398	338	9.9	9.5	12.3	3,847	3,791	4,154
1983	394	403	346	9.6	9.2	12.1	3,777	3,702	4,181
1984 (FY)	386	393	349	8.7	8.3	11.5	3,371	3,241	4,030
1985 (FY)	352	355	333	8.4	7.9	11.2	2,952	2,813	3,718
Average annual percent change:									
1980-83	2.1	2.0	2.5	-2.3	-2.3	-2.1	-0.2	-0.4	0.4
1983-84	-2.9	-3.5	1.0	-11.5	-13.2	-5.7	-14.1	-16.2	-4.8
1984-85	-8.8	-9.6	-4.6	-3.9	-4.0	-3.3	-12.4	-13.2	-7.7
1983-85	-10.7	-11.9	-3.8	-12.5	-14.1	-7.4	-21.8	-24.0	-11.1

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1985

NYSA

decline in the PPS States and a 5.7 percent decline in the waiver States. Although not as large as the in the PPS States, the 5.7 percent decline in the waiver States was still almost three times as great as the historical trend in those States, suggesting that there was some "spillover" effect from PPS. Length of stay continued to decline in 1985, but at a greatly diminished rate. Nationally, length of stay declined from 8.7 days to 8.4 days, a decrease of 3.9 percent. The decrease was somewhat greater in the PPS States (4.0 percent) than in the waiver States (3.3 percent). Since the beginning of PPS, the total decline in length of stay has been 14.1 percent in the PPS States and 7.4 percent in the waiver States.

The product of the discharge rate and the average length of stay is the total days of care rate. This rate had not changed much for the Medicare aged population during the 15 years prior to the advent of PPS. This is because the rate at which discharges had been rising was offset by an almost equal rate of decline in the average length of stay. However, in 1984, the combination of a large decline in length of stay and the first-ever decline in discharges resulted in a 14.1 percent decline in the days of care rate (16.2 percent in the PPS States and 4.8 percent in the waiver States). The decrease in the days of care rate was almost as large again (12.4 percent) in 1985. As it was in 1984, the decrease in 1985 was greater in the PPS States (13.2 percent) than in the waiver States (7.7 percent). Since the beginning of PPS, the days of care rate per 1,000 beneficiaries in the PPS States has declined by almost one-quarter, from 3,777 to 2,952. In the waiver States, the decline has been a more modest 11.1 percent, from 4,181 to 3,718.

These large declines in the days of care rate underscore the difficulty of assessing the meaning of variations in the volume of inpatient care. Various studies (including McPherson et al., 1982 and Gornick, 1982) have



documented large geographic variations in levels of medical care. In general, these variations remain largely unexplained. Wennberg (1986) attributes them to medical uncertainty. Other studies have examined the "appropriateness" of hospital care and found levels of inappropriate care as high as 25 percent (Siu et al., 1986). What these studies appear to illustrate is the considerable discretion exercised in the decisions to hospitalize and to discharge a patient. Changing patterns of practice is another factor that has been suggested. Indeed, the fact that over one-third of the reduction in admissions can be attributed to lens extractions shows the degree to which appropriate reductions can be made under certain circumstances. However, the effect on beneficiaries of such large changes over a short period of time require further analysis. This issue is examined later in this chapter, in the section dealing with mortality and readmission rates.

A major concern is whether or not any changes in utilization rates fell disproportionately on high risk groups, or groups with potential access problems. Table 4.3 presents discharge rates, average lengths of stay and total days of care rates, by age, sex and race in the PPS States. As in 1984, the declines in discharge rates in 1985 were highest for those persons ages 65 to 69 (11.1 percent). The rate of decline was again lowest for those ages 85 and over (8.4 percent). Similarly, white persons had larger decreases in both 1984 and 1985 (3.6 and 9.9 percent) than did nonwhite persons (2.5 and 6.8 percent). By sex, the decline was greater for males in 1984 but greater for females in 1985.

Table 4.3 also presents trends in average length of stay. Length of stay is directly related to the age of the patient. The recent trend toward a narrowing of the age differential continued in 1985. Length of stay

Table 4.3

Discharges per 1,000, average length of stay and total days of care per 1,000,  
for 1980-85 Medicare beneficiaries in PPS States,  
by Age, Sex and Race: 1980 through 1985

Age, sex and race	Calendar year				Fiscal Year		Average Annual percent change			Total Change 1983-85
	1980	1981	1982	1983	1984	1985	1980-83	1983-84	1984-85	1983-85
<u>Discharges per 1,000</u>										
Total	380	382	398	403	393	355	2.0	-3.5	-9.6	-11.9
Age:										
65-69	294	295	300	302	289	256	0.8	-5.7	-11.1	-15.2
70-74	353	354	368	374	362	327	1.9	-4.0	-9.8	-12.6
75-79	424	426	445	453	442	398	2.2	-3.2	-9.9	-12.1
80-84	487	493	518	526	514	469	2.6	-2.9	-8.8	-10.8
85+	532	531	561	569	564	521	2.3	-1.2	-7.6	-8.4
Sex:										
Male	409	409	421	428	415	382	1.5	-3.9	-8.0	-10.7
Female	361	363	382	387	377	337	2.4	-3.2	-10.7	-12.9
Race:										
White	387	388	403	409	398	358	1.9	-3.6	-9.9	-12.5
Other	331	333	355	363	356	332	3.1	-2.5	-6.8	-8.5
<u>Average Length of stay</u>										
Total	9.9	9.7	9.5	9.2	8.3	7.9	-2.3	-13.2	-4.0	-14.1
Age:										
65-69	9.1	8.9	8.8	8.5	7.7	7.4	-2.2	-12.4	-4.0	-12.9
70-74	9.5	9.4	9.2	8.9	8.0	7.8	-2.3	-12.8	-3.0	-12.4
75-79	10.0	9.9	9.7	9.3	8.4	8.1	-2.4	-13.4	-3.5	-12.9
80-84	10.5	10.3	10.1	9.7	8.6	8.3	-2.6	-14.3	-4.3	-14.4
85+	10.9	10.7	10.5	10.0	8.9	8.3	-2.7	-14.3	-6.5	-17.0
Sex:										
Male	9.5	9.4	9.3	9.0	8.1	7.8	-2.0	-12.6	-4.4	-13.3
Female	10.1	9.9	9.7	9.3	8.4	8.1	-2.6	-13.7	-3.7	-12.9
Race:										
White	9.7	9.6	9.4	9.1	8.2	7.8	-2.4	-13.1	-4.0	-14.3
Other	10.9	10.8	10.6	10.2	9.1	8.7	-2.2	-14.2	-4.3	-14.7
<u>Total Days of Care per 1,000</u>										
Total	3,745	3,695	3,791	3,702	3,241	2,813	-0.4	-16.2	-13.2	-24.0
Age:										
65-69	2,674	2,627	2,632	2,562	2,220	1,894	-1.4	-17.4	-14.7	-26.1
70-74	3,374	3,324	3,400	3,331	2,916	2,550	-0.4	-16.3	-12.5	-23.4
75-79	4,262	4,201	4,320	4,231	3,706	3,221	-0.2	-16.2	-13.1	-23.9
80-84	5,102	5,079	5,237	5,094	4,439	3,878	-0.1	-16.8	-12.6	-23.9
85+	5,783	5,663	5,882	5,702	5,032	4,348	-0.5	-15.4	-13.6	-23.7
Sex:										
Male	3,898	3,844	3,897	3,836	3,368	2,960	-0.5	-15.9	-12.1	-22.8
Female	3,639	3,592	3,719	3,611	3,155	2,714	-0.3	-16.5	-14.0	-24.8
Race:										
White	3,763	3,710	3,794	3,702	3,241	2,803	-0.5	-16.2	-13.5	-24.3
Other	3,609	3,577	3,764	3,704	3,241	2,890	0.9	-16.2	-10.8	-22.0

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1985

decreased by 6.5 percent for those aged 85 and over, compared to only 4 percent for those aged 65 to 69. As a result, by 1985 there was a difference of less than a day between these two age groups (8.3 days versus 7.4 days, respectively)--a finding that notably differs from the early years of the Medicare program, when patients in the oldest age group were hospitalized an average of three days longer than those in the youngest age group.

The changes in discharge rate and average length of stay by age, sex and race largely offset each other in the days of care rate. All population subgroups experienced decreases of greater than 20 percent in total days of care per 1,000 over the first 2 years of FPS, with very little difference by age, sex, or race.

In summary, the data indicate that there has been little change in relative utilization levels across age, sex, or race categories. To the extent that the reductions in discharges and length of stay represent decreased access, these decreases have been relatively evenly distributed across demographic categories. Similarly, to the extent that these reductions represent decreases in overuse, they have been equitable. However, some research has suggested that reductions in utilization as a result of financial incentives are made equally at the expense of appropriate and inappropriate hospitalizations (Siu et al., 1986). Thus, continued monitoring and assessment of the impact of these changes is warranted.

DRG-Specific Utilization Rates. As described in the previous annual report, changes in DRG-specific utilization rates in the first year of FPS were so great as to call into question the meaningfulness of interpretations of longitudinal trends in these rates. These changes probably reflected several factors, including:

- o Changing practice patterns;
- o Changes in coding due to PPS incentives (see the discussion in Chapter 2); and
- o Greater detail in the data available on Medicare patient bill records.

Consequently, the analysis in this report examines only the changes that have taken place between 1984 and 1985 in DRG-specific discharge rates and average lengths of stay.

Discharge rates per 1,000 beneficiaries in 1985 are shown in Table 4.4 for the 20 DRG combinations that had the highest rates nationwide in 1984. In the PPS States, 15 of these DRGs decreased in frequency in 1985. Notable exceptions were increases in pneumonia (6.9 percent increase), angina (7.7 percent increase), nutritional and miscellaneous metabolic disorders (23 percent), and major joint procedures (7.9 percent). The largest decreases were for lens procedures (70.6 percent) and atherosclerosis (63.6 percent). In general, the trends in the waiver States were similar to those in the PPS States. However, lens procedures did not decrease as rapidly in the waiver States (36.4 percent). In the waiver States, only 10 of the top 20 DRGs decreased in frequency in 1985.

Changes in length of stay in 1985 are shown in Table 4.5 for the 20 DRG combinations with the longest lengths of stay in 1984. Unlike 1984, in which all of these DRGs experienced a decrease in length of stay, there were five DRGs for which length of stay increased in 1985--psychoses; stomach, esophageal and duodenal procedures; degenerative nervous system disorders; lymphoma or leukemia; and organic disturbances and mental retardation. Increases in these five DRGs occurred in both PPS and the waiver States. In the PPS States, DRGs with decreases greater than 10 percent included hip and

Discharge per 1,000 aged medical beneficiaries  
percent change for PPS States and waiver States for the 20  
most common diagnosis-related groups 1984: 1984- 1985

Diagnosis Related Group	Title	PPS			Waiver		
		Discharges per 1,000		Percent Change	Discharges per 1,000		Percent Change
		1984	1985		1984	1985	
	All Discharges						
127	HEART FAIL & SHOCK	18.7	18.3	-2.2	18.4	18.6	1.2
182-184	ESO/GASTRO/MISC DIG	17.7	13.4	-24.2	12.5	10.9	-12.7
039	LENS PROCEDURES	16.4	4.8	-70.6	18.9	12.0	-36.4
089-091	PNEUMONIA	12.7	13.5	6.9	10.2	11.5	12.1
121-123	AMI	12.1	11.8	-2.4	12.1	12.6	4.2
014	SPEC CEREBRO. DIS	12.1	12.0	-0.7	10.4	10.7	2.1
140	ANGINA	10.6	11.4	7.7	11.5	12.9	12.7
138-139	CARD ARRHYTHMIA	9.0	8.6	-5.0	8.9	8.2	-8.7
088	CHR OBSTR PUL DIS	7.9	5.9	-25.7	6.7	5.8	-13.3
096-098	BRONCHITIS	7.5	7.2	-3.8	5.4	6.0	10.9
243	BACK PROBLEMS	7.5	6.1	-18.1	5.2	4.5	-13.8
336-337	PROSTACTECT.	7.1	7.1	-0.9	5.6	5.9	6.5
015	TR ISCHEMIC ATT	6.8	6.5	-5.3	5.8	6.1	5.1
296-298	NUTRI/MIS METABOL DIS	6.6	8.1	23.0	4.3	5.3	22.5
174-175	G.I. HEMORR	5.8	6.1	5.5	5.2	4.9	-4.3
468	UNRELATED OR PROC	5.5	4.8	-12.7	6.7	6.1	-9.6
209	MAJ JOINT PROCS	5.8	6.2	7.9	4.4	4.3	-1.6
320-322	KID INFECT.	5.8	5.4	-6.9	3.9	4.1	5.2
132-133	ATHEROSCLEROSIS	5.5	2.0	-63.6	3.9	2.7	-31.4
294-295	DIABETES	5.0	3.9	-21.6	5.4	3.9	-26.9

SOURCE: MedPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1985

4436

4.9a

**Table 4.5**  
Average length of stay for aged Medicare beneficiaries and  
percent change for PPS States and waiver States for the 20  
diagnosis-related groups with longest stays in 1984: 1984-1985

DRG	Name	PPS			Waiver		
		Average Length of Stay		Percent Change	Average Length of Stay		Percent Change
		1984	1985		1984	1985	
148-149	MAJ BOWEL PROCS	16.9	15.6	-7.6	20.1	19.0	-5.8
210-212	HIP/FEM PROCS	15.7	13.8	-11.8	23.8	22.2	-6.6
468	UNRELATED OR PROC	15.3	13.4	-12.8	22.8	21.6	-5.0
209	MAJ JOINT PROCS	15.4	13.7	-11.0	20.6	19.3	-6.0
110-111	MAJ RECON VASC PROCS	15.2	14.3	-5.7	18.9	18.0	-5.1
430	PSYCHOSES	14.1	15.0	6.5	21.0	21.8	3.7
154-156	STO/ESO/DUO PROCS	13.9	15.5	11.5	17.7	18.6	5.2
195-198	CHOLECYSTECTOMY	12.3	11.2	-8.8	14.9	14.1	-5.1
236	FRACT HIP/PELVIS	11.0	9.6	-12.9	19.0	18.9	-0.4
112	VASC PROCS EXC MAJ RE	11.5	11.0	-3.9	17.3	16.4	-5.4
014	SPEC CEREBRO. DIS	11.2	9.9	-11.7	18.1	17.3	-4.5
416-417	SEPTICEMIA	10.8	10.1	-7.0	15.5	14.5	-6.5
012	DEGEN NERVOUS SYS DIS	10.3	11.8	14.7	15.9	17.1	8.1
316	RENAL FAIL	10.0	9.1	-8.8	14.4	13.7	-4.9
413-414	OTH MYELO/NEOPLAMS	9.5	8.8	-7.4	14.1	13.5	-4.6
403-405	LYMPH-LEUKEMIA	9.7	10.0	2.9	13.2	13.6	2.9
429	ORG DIST & M.R.	9.4	9.5	0.6	16.0	16.9	5.9
087	PUL EDEMA/ RESP FAIL	9.7	9.2	-5.2	13.1	12.5	-4.8
121-123	AMI	9.7	8.9	-8.4	12.2	11.5	-5.3
203	MALIG - HEP, PAN	9.4	8.7	-7.7	12.5	12.3	-2.3

SOURCE: MedPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1985

femur procedures (11.8 percent); major joint procedures (12.8 percent); fracture of the hip and pelvis (12.9 percent); and specific cerebrovascular disorders (11.7 percent). These are DRGs for which post-hospital sub-acute health care (i.e., skilled nursing and home health) needs are usually quite high. Trends in post-hospital use for patients in some of these DRGs are examined in Chapter 5.

#### Medicare's Disabled Population

The Medicare disabled population increased in 1985, from 2,710,000 to 2,728,000--the first increase in disabled enrollment since 1981. Table 4.7 shows the age and sex distribution of the disabled population for the FPS and waiver States in 1985. The waiver States account for 15 percent of the total disabled enrollment. The age distribution of the disabled in the two sets of States is very similar, with about 50 percent in the 55 to 64 age group. The waiver States have a slightly higher percent of females (39 percent) than do the FPS States (36 percent).

The analysis in the previous annual report found much greater declines in discharge rates for the disabled (10.1 percent) than for the aged population (3.5 percent). In addition, the rate of decline was three times as great for the youngest disabled beneficiaries (18.3 percent) as it was for the oldest groups (5.5 percent) in 1984. Length of stay declined by 12.4 percent for the disabled, but there were no meaningful differences in length of stay changes by age or sex for the disabled population.

Trends in discharges per 1,000, average length of stay, and total days of care per 1,000 for disabled Medicare beneficiaries from 1980 through 1985 are shown in Table 4.8. The discharge rate continued to decline in 1985, by 4.8

Table 4.7

Number and percent distribution of disabled Medicare beneficiaries  
in PPS states and waiver states by age and sex: 1985

(numbers in 1,000s)

Age and Sex	PPS states		Waiver states	
	Number	Percent	Number	Percent
Total	2,327	100	401	100
Age:				
0-44	662	28	112	28
45-54	467	20	80	20
55-64	1,198	51	209	52
Sex:				
Male	1,491	64	244	61
Female	836	36	158	39

SOURCE: Medicare enrollment tables, disabled beneficiaries. Enrollment estimated as of April 1, 1985. Counts exclude persons with end-stage renal disease.



Table 4.8  
Discharges per 1,000, average length of stay and  
total days of care per 1,000 for disabled Medicare  
beneficiaries in the U.S., PPS states and waiver  
states, 1980-1985

Year	Discharges per 1,000			Average length of stay			Days of care per 1,000		
	U.S.	PPS States	Waiver States	U.S.	PPS States	Waiver States	U.S.	PPS States	Waiver States
1980	408	417	355	9.6	9.2	11.9	3,904	3,853	4,208
1981	408	418	349	9.5	9.2	11.6	3,874	3,846	4,046
1982	433	443	377	9.5	9.1	11.6	4,095	4,048	4,366
1983	437	447	375	9.3	9.0	11.5	4,052	4,007	4,316
1984 (FY)	406	413	365	8.5	8.1	11.1	3,456	3,349	4,047
1985 (FY)	387	393	352	8.3	7.9	10.8	3,199	3,099	3,786
average annual percent change							1.2	1.3	0.8
1980-83	2.3	2.4	1.9	-1.0	-1.0	-1.0	-19.1	-21.3	-8.2
1983-84	-9.3	-10.1	-3.4	-10.8	-12.4	-5.0	-7.4	-7.4	-6.4
1984-85	-4.5	-4.8	-3.6	-3.0	-2.8	-2.9			
Total Change 1983-85	-11.3	-12.1	-6.1	-11.0	-12.0	-6.6	-21.1	-22.6	-12.3

SOURCE: MedPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1985

percent in the PPS States (413 per 1,000 in 1984 to 393 per 1,000 in 1985), and by 3.6 percent in the waiver States (365 per 1,000 in 1984 to 352 per 1,000 in 1985). Thus, in contrast to the aged population, which had a much greater decrease discharge rate in 1985 than in 1984, the disabled had a smaller decrease in 1985. The total decline in the discharge rate for the disabled in PPS States from the beginning of PPS through 1985 was 12.1 percent, virtually identical to the 11.9 percent decline among the aged (as shown in Table 4.2). This 12.1 percent decline in the PPS States was about twice as great as the 6.1 percent decline in the waiver States.

Average length of stay for the disabled population declined in 1985 by 2.8 percent in the PPS States (from 8.1 days to 7.9 days) and by 2.9 percent in the waiver States (from 11.1 days to 10.8 days). The net decline in length of stay for the disabled since the beginning of PPS has been 12.0 percent in the PPS States and 6.6 percent in the waiver States. These are roughly similar to the declines in length of stay for the aged. In the PPS States, total days of care per 1,000 dropped by 24.0 percent for the aged and by 22.6 percent for the disabled. In the waiver States, the decrease was 11.1 percent for the aged and 12.3 percent for the disabled.

One of the findings from the previous analysis was a very large decrease in discharges per 1,000 for disabled persons under the age of 45 relative to other disabled persons. In 1985, this discrepancy largely disappeared (Table 4.9). In 1984, persons under the age of 45 experienced an 18.3 percent decline in discharges per 1,000, compared to a 5.5 percent decline among persons aged 55 to 64. However, in 1985 there was an increase of 2.7 percent in discharges per 1,000 for persons under age 45, while there were decreases of about 6 percent in the other two age groups. The net result is that, since the beginning of PPS, the total decline in discharges per 1,000 among

**Table 4.9**  
**Discharges per 1,000, average length of stay and total days of care per 1,000,**  
**for disabled Medicare beneficiaries in PPS States,**  
**by Age, Sex and Race: 1980 through 1985**

and	Calendar year			Fiscal Year		Average Annual percent change			Total Chang
	1980	1981	1982	1983	1984	1985	1980-83	1983-84	1984-85
<u>Discharges per 1,000</u>									
Total	417	418	443	447	413	393	2.4	-10.1	-4.8
44 years	313	311	339	336	289	297	2.4	-18.3	2.7
54 years	427	435	464	474	431	406	3.5	-11.9	-5.8
64 years	459	461	483	491	470	442	2.2	-5.5	-6.1
Male	386	390	411	416	381	368	2.5	-11.0	-3.5
Female	472	468	498	503	470	439	2.2	-8.7	-6.5
<u>Average Length of stay</u>									
Total	9.2	9.2	9.1	9.0	8.1	7.9	-1.0	-12.4	-2.8
44 years	8.8	9.1	9.2	9.2	8.3	8.3	1.3	-13.4	0.6
54 years	8.9	8.8	8.9	8.7	7.9	7.6	-0.5	-12.5	-3.2
64 years	9.4	9.4	9.2	9.0	8.1	7.8	-1.7	-12.1	-4.0
Male	8.9	8.9	8.9	8.7	7.9	7.7	-0.9	-11.9	-2.7
Female	9.7	9.6	9.5	9.3	8.4	8.1	-1.2	-13.2	-2.9
<u>Total Days of Care per 1,000</u>									
Total	3,853	3,846	4,048	4,007	3,349	3,099	1.3	-21.3	-7.4
44 years	2,772	2,841	3,115	3,089	2,385	2,463	3.7	-29.2	3.3
54 years	3,782	3,825	4,132	4,133	3,399	3,099	3.0	-22.9	-8.8
64 years	4,337	4,319	4,447	4,401	3,830	3,451	0.5	-16.9	-9.9
Male	3,450	3,484	3,651	3,620	3,017	2,834	1.6	-21.6	-6.1
Female	4,557	4,480	4,743	4,686	3,937	3,572	0.9	-20.7	-9.3

SOURCE: MEDPAR/PATBILL Files and Medicare Enrollment Counts, 1980 to 1985

the youngest disabled (11.7 percent) is only slightly greater than among persons ages 55 to 64 (10.0 percent), and slightly less than among persons ages 45 to 54 (14.4 percent). Females in the disabled population experienced a larger decline in discharges per 1,000 (6.5 percent) in 1985 than did males (3.5 percent), also reversing the trend observed in 1984.

The youngest disabled also had a larger decline in length of stay in 1984. This, too, was reversed in 1985, with the youngest disabled experiencing a small (0.6 percent) increase in length of stay, compared to a 3.2 percent decrease among persons aged 45 to 54 and a 4.0 percent decline among persons aged 55 to 64. In terms of total days of care per 1,000, the net change for the disabled since the beginning of PPS is similar to that for the aged. The age differential observed in 1984 has essentially disappeared. All age and sex groups in the disabled population have experienced declines of over 20 percent, ranging from a high of 25.0 percent among persons ages 45 to 54 to a low of 20.3 percent among persons under the age of 45. In 1985, persons under age 45 had the greatest decrease in total days of care per 1,000.

#### Medicare's End Stage Renal Disease Population

The Medicare ESRD dialysis population for the years 1981 through 1985 is shown in Table 4.10. The size of this population in 1985 was 82,422, a 4.6 percent increase over 1984. The increase in enrollment was greatest for persons aged 65 and over (10.5 percent), reflecting an increase in the rate at which elderly ESRD patients are put on dialysis. ESRD dialysis program enrollment decreased for all persons under the age of 35. The decreases in the 0 to 14 and 25 to 34 age groups were the first enrollment decreases since

Table 4.10  
End-Stage Renal Disease Dialysis Patient Enrollment  
by Age Group: 1980 to 1985

Age	1981	1982	1983	1984	1985	Average Annual percent change		
						1981-83	1983-84	1984-85
0-14	521	582	595	628	607	6.9	5.5	-3.3
15-24	3,033	3,030	2,952	2,897	2,753	-1.3	-1.9	-5.0
25-34	7,453	7,665	7,845	7,979	7,930	2.6	1.7	-0.6
35-44	8,616	9,179	9,909	10,536	10,951	7.2	6.3	3.9
45-54	12,205	12,809	13,228	13,628	13,828	4.1	3.0	1.5
55-64	16,085	17,794	19,189	20,125	20,954	9.2	4.9	4.1
65+	15,691	17,885	20,704	22,976	25,399	14.9	11.0	10.5
Total	63,604	68,944	74,422	78,769	82,422	8.2	5.8	4.6

SOURCE: HCFA, BDMS, OSDM, ESRDMMIS data: 1980 TO 1984

the implementation of the Medicare ESRD program in 1973. These decreases are due to the increased numbers of transplants and increased graft survival among transplanted patients.

Unlike the aged and disabled populations, discharge rates for the ESRD population increased (by 2.9 percent) during the first year of FFS. Changes differed by age group, ranging from a 12.2 percent increase among those aged 65 and over to a 29 percent decrease among persons under 15 years of age. Length of stay decreased by 11.5 percent for ESRD patients, from 10.0 days in 1983 to 8.8 days in 1984. Total days of care per 1,000 ESRD beneficiaries decreased by 9.0 percent, ranging from a 36.1 percent decline among those under 15 years of age to an 11.3 percent decline among those aged 65 and over.

Discharge rates per 1,000, average length of stay, and total days of care per 1,000 for the ESRD population are shown in Table 4.11 for the calendar years 1981 through 1985. Discharges per 1,000 for this population declined by 2 percent, from 1,240 in 1984 to 1,215 in 1985. This decline was less than those experienced by the aged (9.6 percent) and the disabled (4.8 percent) populations. Since the beginning of FFS, discharges per 1,000 ESRD beneficiaries have remained virtually unchanged (1,206 per 1,000 in 1983 and 1,215 per 1,000 in 1985). The largest decrease in discharges among the ESRD population was for those under 15 years of age, who experienced a 2-year decrease of 45.5 percent. Most other age groups in the ESRD population also experienced declines in discharges per 1,000 in 1985, with the exception of those aged 45 to 54 (0.4 percent increase) and those aged 65 and over (no change).

There was a leveling off of average length of stay for the ESRD population in 1985. Length of stay for ESRD patients declined from 8.8 days

Table 4.11

Discharges per 1,000, average length of stay and total days of care per 1,000,  
for <sup>ESRD</sup> Medicare beneficiaries in PPS States,  
by Age, Sex and Race: 1980 through 1985

Age	Calendar year				1985	Average Annual percent change			Total Change 1983-85
	1981	1982	1983	1984		1981-83	1983-84	1984-85	
Discharges per 1,000									
Total	1,221	1,166	1,206	1,240	1,215	-0.6	2.9	-2.0	0.8
0-14	1,392	1,533	1,523	1,081	830	4.6	-29.0	-23.2	-45.5
15-24	1,075	1,096	1,069	1,010	949	-0.2	-5.6	-6.0	-11.2
25-34	1,062	1,109	1,085	1,062	1,037	1.1	-2.2	-2.3	-4.5
35-44	1,105	1,117	1,117	1,118	1,049	0.5	0.2	-6.2	-6.1
45-54	1,158	1,137	1,197	1,143	1,147	1.7	-4.5	0.4	-4.2
55-64	1,276	1,262	1,264	1,285	1,223	-0.5	1.7	-4.8	-3.2
65+	1,376	1,139	1,256	1,410	1,410	-4.5	12.2	0.0	12.3
Average Length of Stay									
Total	10.3	10.1	10.0	8.8	8.7	-1.4	-11.5	-1.2	-12.6
0-14	9.6	9.5	9.4	8.5	8.4	-0.7	-10.0	-1.3	-11.1
15-24	9.2	8.7	8.4	7.3	7.3	-4.3	-13.3	-0.5	-13.8
25-34	9.6	9.0	8.8	7.8	7.7	-4.4	-11.2	-1.2	-12.2
35-44	9.9	9.6	9.2	8.1	8.0	-3.4	-11.7	-2.1	-13.6
45-54	9.8	9.7	9.5	8.3	8.2	-1.1	-13.0	-0.6	-13.5
55-64	10.3	10.4	10.1	8.9	8.6	-0.7	-12.2	-3.0	-14.8
65+	11.2	10.8	11.1	9.7	9.6	-0.7	-12.0	-1.1	-13.0
Total Days of Care per 1,000									
Total	12,559	11,723	12,050	10,969	10,616	-2.0	-9.0	-3.2	-11.9
0-14	13,294	14,570	14,345	9,170	6,952	3.9	-36.1	-24.2	-51.5
15-24	9,864	9,484	8,998	7,365	6,886	-4.5	-18.2	-6.5	-23.5
25-34	10,214	9,963	9,541	8,287	7,998	-3.3	-13.1	-3.5	-16.2
35-44	10,929	10,737	10,307	9,113	8,364	-2.9	-11.6	-8.2	-18.8
45-54	11,291	11,056	11,408	9,476	9,453	0.5	-16.9	-0.2	-17.1
55-64	13,139	13,134	12,825	11,449	10,571	-1.2	-10.7	-7.7	-17.6
65+	15,456	12,343	13,895	13,721	13,568	-5.2	-1.3	-1.1	-2.4

SOURCE: BCFA, BDMS, OSDM, ESRDMMIS data: 1980 TO 1984

to 8.7 days (1.2 percent), and was roughly consistent across age groups. The total net decline in average length of stay for ESRD patients since for the first 2 years of PPS was 12.6 percent (compared to 14.1 percent among the aged and 12.0 percent among the disabled). Total days of care per 1,000 ESRD beneficiaries declined by 3.2 percent in 1985, for a net decrease of 11.9 percent since PPS began. Among ESRD beneficiaries less than 15 years old, the decline was 51.5 percent. Decreases for other age groups were in the range of 20 percent, except for the 65 and over age group, which had a net decline was only 2.6 percent.

The large decline in discharges among the youngest ESRD group could be due in part to data quality problems in the earlier years. In 1981, there was a 25 percent underreporting of kidney transplants among ESRD beneficiaries. By 1984, reporting was essentially complete. Transplant recipients average 2.5 discharges in the year in which the transplant occurs. Inclusion of these persons in the dialysis population would bias utilization rates upward, particularly for those in the younger age groups, among whom transplantation is a frequent event. This may explain why, in 1983, this group had the highest discharge rate among any ESRD age group and did not follow the general age-related pattern. By 1985, the discharge rate for ESRD beneficiaries under 15 years of age was the lowest of any age group, and in line with the general pattern of increasing discharge rates for older groups.

#### Mortality Trends and Rehospitalization

This section describes trends in mortality in the Medicare population. It begins with a population-based analysis of mortality among the aged,



disabled and ESRD populations. This is followed by an analysis of hospital-related mortality, which examines the impact of patient severity changes on trends in hospital mortality. A final section describes trends in rehospitalization among Medicare beneficiaries.

As described in the previous annual report, the use of mortality as an outcome measure for assessing PPS effects involves several varied and complex methodological issues. In addition (as discussed in Chapter 2), there is the problem of attribution. Among the wide variety of factors that affect mortality but are not directly related to the practice of medical care are general standards of living and personal health practices, as well as periodic events, such as influenza epidemics and intense weather conditions. Changes in the population mix also make it difficult to attribute observed effects to PPS. Although this is not necessarily a problem in the analysis of population-based mortality among the aged, it will be seen that it is a critical issue in the analysis of both disabled and ESRD population-based mortality and in the analysis of hospital-based mortality. For these reasons, the following analyses must be considered largely descriptive.

#### Population-Based Mortality

Aged Population. This section focuses on the overall mortality of the U.S. aged population. The data analyzed herein are taken from vital statistics reports from NCHS, and include data on all persons age 65 and over. Detailed data on age-specific mortality by State were not available to allow a comparison of the experience of PPS and waiver States.

As described in the previous annual report, NCHS mortality data from the years 1968 through 1983 (age-adjusted to the distribution of the 1980

equations and by statistically testing whether the time series of utilization measures are different after the implementation of PPS.<sup>2</sup>

Results of this multivariate analysis suggest that PPS has increased the percentage of patients receiving HHA visits within 7 days of discharge by 14.3 percent, while increasing SNF admissions in the same time period by over 65 percent. The increase in SNF admissions as a percentage of hospital discharges was also found to result partially from the increased severity of beneficiaries at hospital admission and shorter inpatient lengths of stay. The PPS effect on HHA visits, however, is virtually unchanged when severity and length of hospital stay are held constant.

#### Changes in Medicaid-Reimbursed Post-Hospital Services for Dual Eligibles

This section presents utilization and expenditure data pertaining to post-discharge services reimbursed under the Medicaid programs in the States of Michigan and California, for beneficiaries dually eligible for Medicare and Medicaid (Medicare/Medicaid "crossover" recipients). These patients represent the impoverished elderly and disabled Medicare population and constitute about 22 percent of all Medicaid enrollees and 14 percent of Medicare beneficiaries. Data on Medicaid utilization are included in this report because Medicaid, with its extensive coverage of long-term care services, may have absorbed some of the increased demand for post-hospital services generated by PPS. These data are presented on a pre-/post-PPS basis for the years 1982 and 1985.

---

<sup>2</sup> The pooled cross section-time series analysis using quarterly data is similar to the approaches suggested by the U.S. General Accounting Office (1986).

The unit of analysis is the hospital episode and a 60-day aftercare period. The data reported here focus on the changes in utilization and expenditures for sub-acute care services received during the post-hospital or aftercare period. Measures include the probability, level of use, and amount of Medicaid expenditure per episode for outpatient physician long-term care, institutional care, prescription drugs, and home health care. Expenditure data for 1985 have been deflated to 1982 levels. Results of this analysis, conducted by SysteMetrics, Inc., are shown in Table 5.12.

In Michigan, each of the three measures--probability of use, utilization, and expenditures per episode--showed a consistent pattern for long-term care use, with decreases in SNF, intermediate care facility (ICF), and home health services. Increases in prescription drug use were indicated, and for physician services the pattern was less consistent, with an increase in probability of use and utilization and decrease in expenditures per episode declined.

California showed less consistency in the measures of pre-/post-PPS changes in aftercare use. The only area in which the California data were in agreement with the Michigan data was in the area of SNF and ICF increases. For physician services, the probability of use went down, but expenditures per episode went up. The probability of receiving prescription drugs and the number of prescriptions showed increases in the post-PPS period for California, as they did for Michigan. However, expenditures for prescription drugs decreased, unlike the Michigan result. California exhibited a modest increase in home health utilization and expenditures per episode, which is more consistent with national trends toward increases in Medicare reimbursed home health care. However, the level of HHA use in California shows that it is basically a Medicare-type benefit. The same findings generally held true

Table 12-5.12

Medicare/Medicaid Dually Eligible Beneficiaries  
Utilization and Expenditures for Sub-Acute Post-Hospital Services  
in Michigan and California

	Michigan		California	
	Pre-PPS	Post-PPS	Pre-PPS	Post-PPS
<u>Probability of Use</u>				
Outpatient Physician	.826	.842	.712	.706
Prescription Drug	.894	.905	.808	.813
SNF or ICF	.199	.184	.129	.124
Home Health	.013	.009	.006	.006
<u>Utilization per Episode</u>				
Outpatient MD Visits	3.240	3.829	-	-
Drug Prescriptions	8.378	8.865	4.778	4.785
Total LTC Days	9.262	8.360	5.016	4.830
Home Health Visits	.118	.081	.020	.027
<u>Expenditures per Episode</u>				
Outpatient	56.35	51.78	84.15	74.69
Prescription Drug	58.60	58.80	37.89	33.74
Total LTC	265.41	247.58	150.06	145.49
Home Health	3.71	2.66	.79	.92

Source: Tape to Tape Data Base: HCFA

for various sub-populations broken out on the basis of nursing home residence, age, and diagnosis.

In general, these data show no dramatic changes between the pre- and post-PPS periods, indicating that Medicaid did not absorb much of the expected increase in post-hospital services under PPS. To the contrary, most of the measures showed some decrease from the pre- to the post-PPS period.

Table 5.12 also shows consistently large differences between the two States for each of the measures studied. With the exception of expenditures for prescription drugs, California showed consistently lower values for both the pre- and post-PPS periods. For example, the volume of drug prescriptions in Michigan was found to be nearly twice that for California in both periods. Other studies have shown California Medicaid to be characterized by broad coverage (in number of persons) but less intensity (in expenditure per person). These comparisons suggest that there may be large regional variations across the country in the extent to which Medicaid programs absorb the potential spillover from Medicare in post-discharge services.

The consistent patterns exhibited in the Michigan data probably reflect a general shift away from institutional and structured care settings to increased usage of individual physician managed care. While there were a number of Medicaid programmatic changes in Michigan (the most dramatic of which was the introduction of hospital prospective payment and prior authorization systems) none of these changes was related directly to post-hospital sub-acute care. Hence, it would be difficult to explain these shifts as being induced by policy factors.

## Evaluating the Appropriateness of Post-Hospital Care

In order to provide more definitive information on the appropriateness of post-hospital care, HCFA is undertaking a major study involving a number of unique characteristics, including:

- o The application of professionally developed guidelines to determine the extent to which beneficiaries are receiving minimally adequate care;
- o Consideration of all types of post-hospital care, including both skilled and unskilled care;
- o Linkages of patient need, types of care received, and intermediate outcomes specific to these factors, not available in secondary data bases.

This study is comprised of two projects: a pilot study and a major national study. The pilot study is currently underway and is nearing the end of the design phase, and the field work phase began in the fall of 1987. The pilot project is planned for completion in the spring of 1988. The national study is expected to be initiated in the summer of 1988 and will build upon the methodologies developed in the pilot project. The national study will take approximately 3 years to complete.

### National Study Objectives

The national study has two primary objectives. The first objective is to evaluate the appropriateness and effectiveness of post-hospital services (aftercare) for Medicare beneficiaries discharged to the community under

FPS. Appropriateness and effectiveness will be assessed through the use of professionally developed guidelines of care and health status outcome assessments. Comparisons will be made across hospital types, patient groupings, and regions of the country. The second objective is to determine the nature and extent of problems encountered by patients in obtaining post-hospital care and to assess other factors associated with less-than-adequate service patterns, including potential barriers to the receipt of needed services (e.g., financial barriers and provider availability), informal caregiver burdens, out-of-pocket costs, discharge planning, and patient (dis)satisfaction.

#### Pilot Study Objectives and Scope

The objective of the pilot study is to develop, field test, and refine methods and data collection strategies for each of the following study components: patient screening protocol, aftercare guidelines, and outcome analysis.

The pilot study target population consists of elderly Medicare beneficiaries discharged to the community from acute care hospitals--not including Medicare end-stage renal disease enrollees, disabled beneficiaries under age 55, or beneficiaries discharged to nursing homes or other institutional settings. The study sample will be drawn from two States representing short and long length of stay patterns. The States chosen for the pilot study are Ohio (long stay) and Washington (short stay). A total of eight hospitals were included in the sample, representing urban and rural areas evenly divided between the two States. Approximately 1,300 patients will be included in the study. The major components of the study design are discussed below.

Patient classification is used in this project to define the study population and to selectively sample patients who are at relatively higher risks of experiencing inappropriate aftercare and related adverse outcomes. Two types of screens are used: a study population screen and a risk classification screen. The purpose of the study population screen is to identify patients who are at risk of needing some type of aftercare. This represents the initial screen for identifying patients to be included in the study. Patients are screened into the study population based upon diagnoses and surgical procedures clinically determined to be associated with aftercare needs. Patients are also screened into the study if their functional status indicates a need for aftercare--irrespective of their diagnoses or surgical procedures performed during the hospital episode preceding the 2-week aftercare period.

Diagnostic and surgical procedure data will be abstracted from the medical record within 2 weeks following discharge. Functional status data will be collected during the screening portion of a patient/caregiver interview 2 weeks following the patient's discharge from the hospital.

The risk classification screen will be used to categorize patients (previously screened into the study) based upon their relative risks of experiencing inappropriate aftercare and related adverse outcomes. This screen provides the basis for insuring statistical precision (through oversampling) for subgroups of patients whose risk category deems them as very high risk groups.

The approach used to determine the study population and relative risks is based on a number of data elements gathered during the 2-week post-discharge interview and the patient's medical record referred to above. These include data on severity of illness, social/living arrangements, functional status, and other patient characteristics.



The basic purpose of the aftercare guidelines is to determine whether post-discharge services received by elderly Medicare beneficiaries are appropriate, by comparison with minimum professional standards of care. These guidelines will be applied to all patients who pass the study population screen and selected for the sample.

The aftercare guidelines represent minimal standards of aftercare services (developed through professional consensus) typically required by specified types of patients. They have been designed to represent a threshold which, if not met, would place most patients at a high risk of adverse outcomes. For example, the guidelines indicate medication monitoring, diabetic teaching and other types of minimal care for newly diagnosed, insulin dependent, diabetic patients. Each guideline specifies the type of patient, type of care required, the timing and frequency of professional provider visits, and related adverse outcomes associated with sub-minimal care. A total of 34 distinct guidelines cover both skilled and unskilled needs. They have been designed to be comprehensive and cover all elderly Medicare patients discharged to a community setting in need of post-hospital services.

The purpose of the outcome analysis is to determine the effectiveness of services received and to assess the validity of the patient screens and the aftercare guidelines. Outcome data will be gathered primarily during the 2-week post-discharge interview and a 6-week post-discharge interview. In the national study, linkages will be made to the Medicare Statistical System for assessing longer-term impacts, primarily mortality and readmissions. The following types of outcome data will be utilized: adverse events, such as falls and burns; functional ability; unwarranted signs and symptoms (e.g., fatigue, pain); morbidity, as measured in terms of complications, readmissions, etc.; and mortality.

## Procedures for Assuring Quality of Post-Hospital Services

### HCFA's Program for Quality Assurance

HCFA is committed to assuring that our nation's ill and elderly receive appropriate and quality care at all points within the health care delivery system supported by Medicare program payments. HCFA contracts with State survey agencies to periodically and routinely inspect all providers and suppliers of services participating in the Medicare program and to certify to HCFA whether they meet requisite health, safety, and quality standards. This applies to hospital stays and to post-hospital care as well, i.e., care furnished by SNFs and HHAs.

Enforcement of requirements governing discharge planning improves the likelihood that a patient's post-hospital placement will be appropriate. Moreover, HCFA is working to develop a uniform resident assessment form that will be used by hospitals and other providers to assess a beneficiary's physical/medical and psychosocial needs prior to discharge. These two measures form a key link in the transition of patients from one level of care to another.

Significant changes in the survey process implemented in August 1986 focus survey efforts on the quality of care furnished to long-term care residents. Specifically, the survey orientation in SNFs and ICFs now emphasizes looking firsthand at residents and observing them and the care they are given, rather than concentrating on administrative and procedural requirements.

A recent report by the National Academy of Sciences' Institute of Medicine made recommendations to improve the quality of care and quality of

life in long-term care settings, by changing the conditions of participation, the survey process itself, and enforcement activities. HCFA responded to these recommendations by proposing new conditions of participation in October 1987 and publishing new administrative rules for survey and certification in November 1987.

Because community-based home health service is one of the fastest growing components of the health care delivery system, quality assurance procedures and efforts are being strengthened and expanded in the home health survey process. In concert with the resident-centered SNF/ICF Long Term Care Survey process, the home health survey process is being revised as an outcome oriented approach. This process has been installed with measures and procedures tailored to evaluate patient outcomes through a patient-centered approach of direct observation. These initiatives include home visits, with prior beneficiary consent, and personal interviews with both beneficiaries and direct care providers to verify that plans of treatment are being carried out and that the services are of high quality. Under development is a regulatory approach to training home health aides which requires that aides must complete an initial training program as well as ongoing participation in continuing education.

#### Peer Review Organization Activities

Both OBRA86 and the Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA) contain provisions specifying Peer Review Organization (PRO) activities with respect to aftercare. Section 9352 of OBRA86 requires PROs to review at least a sample of readmissions within 31 days to PPS hospitals and the intervening post-hospital care (HHA, SNF, and outpatient hospital)

for the quality of care rendered to Medicare beneficiaries in those settings. This provision became effective for PRO contracts entered into or renewed on or after January 1, 1987. The first contract to include this review was for the Pennsylvania PRO, effective July 1, 1987. Generic quality screens have been developed for each specific health care delivery settings and included in the Pennsylvania contract. Results of the Pennsylvania test will be used to refine the screens (where appropriate) and develop a methodology for post-hospital review under the next round of PRO contracts, in 1988-90.

Section 9403 of COBRA authorized PROs to deny payments when the quality of health care services provided to Medicare beneficiaries does not meet professionally recognized standards of health care. A regulation covering this provision is being developed for inpatient hospital care, and one will be developed for post-hospital care (HHA, SNF and outpatient hospital).

Section 9353 of OBRA86 requires PROs to review the quality of care provided by risk-based health maintenance organizations (HMOs) and competitive medical plans (CMPs), for services furnished on or after April 1, 1987. Review of the quality of care provided by HMOs began in June 1987.

OBRA86 also expands to SNF, HHA and HMO/CMP settings already existing PRO review activities, such as responses to beneficiary complaints about quality of care.

#### Other Nonhospital Quality Review

PROs also will be reviewing the quality of care in other noninpatient settings, as specified in two sections of COBRA and one of OBRA86. COBRA Section 9307, Payment for Assistants at Surgery for Certain Cataract

Operations and Other Operations, provides that no Medicare payment may be made for an assistant at cataract surgery unless the PRO or Part B carrier finds, before the procedure is performed, that an assistant is medically necessary. Instructions for PRO review of this activity, effective March 1, 1987, were issued to the PROs on December 30, 1986.

COBRA Section 9401, 100 Percent Peer Review of Certain Surgical Procedures, requires peer review on a preadmission/preprocedure basis of at least 10 surgical procedures. PRO physicians would decide either that a particular surgery is or is not medically necessary, or that the patient should seek a second opinion. A Notice of Proposed Rule-Making, containing the list of proposed procedures that PROs will review and the list of specialists who may perform the second opinions, has been prepared for public comment by HCFA.

OBRA86 requires PROs to review surgical procedures performed in hospital outpatient departments and ambulatory surgery centers (effective for contracts entered into or renewed on or after January 1, 1987). PRO review of hospital outpatient departments and ambulatory surgery centers will be implemented in Pennsylvania beginning July 1, 1987.

#### Reconsiderations and Appeals

Medicare beneficiaries have the right to have decisions regarding payment of their denied Medicare Part A claims be reconsidered by intermediaries. If dissatisfied with the reconsideration decision, beneficiaries have the option of filing for an informal hearing conducted by an Administrative Law Judge (ALJ). The hearing decision, in turn, can be appealed to an Appeals Council. The appeal may be filed by the beneficiary or by the HCFA regional

office, based upon an analysis of the ALJ's hearing decision. Both the hearing and the appeal require that the disputed amount be over \$100, if the denial was made by an intermediary, or \$200, if the denial was made by a PRO.

At each level of review one of five dispositions may occur. The case may be:

- o Affirmed;
- o Dismissed;
- o Partially Reversed;
- o Fully Reversed; or
- o Withdrawn.

A final appeal may be filed with the Federal district court, if the disputed amount is over \$1,000 in the case of an intermediary denial, and \$2,000 in the case of a PRO denial.

This section presents preliminary, baseline information regarding the volume and disposition of reconsiderations, hearings, and appeals filed for denied Part A Medicare claims (as required under Section 9305(i)(1)(B) of OBRA86). Current data are limited to overall case reviews for the year 1986.

Table 5.13 summarizes the number and disposition of cases completed at each of the three levels of review. In calendar year 1986, there were a total of 42,145 cases reviewed, the majority (95 percent) of which were represented by case reconsiderations. Of the total number of reconsiderations, only 1,921 received a formal hearing which, in turn, resulted in 340 appeals. At the reconsideration level of review, the great majority of case decisions were affirmed by the intermediary--26,417 (66 percent) of the 39,884 reconsideration cases were affirmed. However, at the

Table 12.5.13

Part A Case Reviews by Disposition Category  
Calendar Year 1986

<u>Disposition Category</u>	<u>Case Reviews</u>			Total
	Reconsiderations	Hearings	Appeals	
Affirmations	26417	479	109	27005
Dismissals	6067	325	40	6432
Partial Reversals	3248	112	58	3418
Full Reversals	4097	1005	132	5234
Withdrawals	55	0	1	56
Total	39884	1921	340	42145

hearing level, the majority of case decisions were reversed--1,005 reversals (52 percent) versus 479 (25 percent) affirmations. Similarly, at the hearing level, 132 case decisions (39 percent) were reversed, as opposed to 109 (32 percent) affirmed.

As mentioned above, these data represent preliminary baseline information. Future reports will present similar, provider specific, information as a means of monitoring trends, over time, in Part A claims review decisions.

#### Summary and Conclusions

This chapter reviews recent trends in post-hospital care and assesses the relationship of these trends to PPS, to the extent possible. It also reviews recent changes in the State surveying procedures and other provisions to monitor quality of care in post-hospital service delivery. Finally, it describes recent data on reconsiderations and appeals.

The use of HHA services has increased rapidly among Medicare beneficiaries in recent years. The increase in utilization began before the implementation of PPS and continued after implementation in 1984. The percent of beneficiaries using HHA services following hospitalization increased over all age groups and across all States.

Use of SNF services increased following implementation of PPS, after a period of no increase in use (as a percent of live hospital discharges) from 1981 to 1983. It appears likely that the increase in SNF use is related to PPS, because the substantial growth of SNF use in the PPS States (44 percent from 1983-85) exceeded the growth of SNF use in the waiver States (19 percent), and followed a 2-year period of no growth in the PPS States. In



addition, the increase in SNF use in the PPS States was greater following discharge from hospitals with large length of stay reductions than from those with small reductions.

The role of PPS in the increase in the use of HHA services is not as clear. The increase in HHA use had begun well before PPS was implemented, and the trend toward greater use merely continued in the PPS States after 1983 (use did not increase in the waiver States after 1983, however). Increase in HHA use was also greater following discharge from hospitals with small length of stay reductions than from those with large reductions. Thus, the increase in HHA services during 1983-85 is probably related to a variety of factors, such as the increase in the number of HHAs (see Chapter 7).

A time-series analysis indicated a small effect of PPS on home health use and a larger effect on SNF use.

A review of the medical records of patients from nine hospitals revealed that patients are sicker on average both at time of hospital admission and discharge under PPS than they were before PPS. As part of that study, Abt Associates found that there was a trend toward less use of SNFs by patients with very high severity and dependency levels. Given the small and nonrandom sample, however, these results cannot be generalized to the nation as a whole.

A study by Duke University of samples of noninstitutionalized functionally impaired beneficiaries suggests that this group used fewer SNF services post-PPS and that largest reductions occurred among the most impaired groups. These groups of functionally impaired beneficiaries also experienced a decline in length of stay similar to that experienced by other Medicare beneficiaries. Although it is possible that reductions in the use of Medicare SNF services by sicker beneficiaries might represent a shift to

Medicaid or private SNF care, this seems unlikely, given the reported lack of growth in Medicaid SNF and ICF use in Michigan and California for dual eligibles.

The findings in this section do not indicate any widespread problems with access to post-hospital care following implementation of PPS. They do raise a question about whether there is a problem with access to SNF care for the most severely ill and impaired elderly. The use of SNF care by this group declined following PPS, which is the opposite of the trend for all aged beneficiaries combined. These findings are only suggestive, however, and do not yet provide strong evidence that access to SNF services has deteriorated for the most severely ill under PPS. One reason is that the findings reported here are based on small samples from special populations. More importantly, descriptive statistics on use of services do not allow one to conclude whether levels of care were appropriate or not. A more detailed national study to evaluate the appropriateness of post-hospital care is being developed, and should provide input into future annual reports.

## REFERENCES FOR CHAPTER 5

Forgy, L. and Williams, J. "Preliminary Analysis of Mediquial Data." Unpublished working paper. Cambridge, Massachusetts: Abt Associates, Inc., May 1987.

Schmitz, R.J. "An Overview of Post-Hospital Care Utilization." Unpublished working paper. Cambridge, Massachusetts: Abt Associates, Inc., July 1987.

U.S. General Accounting Office. Post-Hospital Care: Efforts to Evaluate Medicare Prospective Payment Effects Are Insufficient. Report to the Chairman, Special Committee on Aging, United States Senate, June 1986.

## Chapter 6

### IMPACT ON OTHER PAYERS

#### Introduction

##### Overview

The Medicare program accounts for over one-quarter of all expenditures on hospital care in the United States, clearly establishing it as the largest single payer for inpatient hospital services. Given the dominant role played by Medicare and the dramatic change in the way that Medicare pays for inpatient hospital services under prospective payment, it is reasonable to expect that the new system might have a noticeable affect on the other major third-party payers for health care, including state Medicaid programs, Blue Cross and Blue Shield plans, commercial insurers, and alternative health plans.

Identifying the impact of the prospective payment system (PPS) is complicated by the many other changes that have taken place in the market for health care in recent years. However, it is important to examine the ways that other payers are responding to these changes--regardless of the ability to attribute them to PPS--because they may have a material affect on the ability of both Medicare beneficiaries and other patients to acquire the health care that they need. The purpose of this chapter is thus to present and discuss the available evidence on the impact of PPS on payers other than the Medicare program, particularly in their financing of inpatient hospital services.

## Data Sources

The data used in this chapter came from a number of sources. The Health Care Financing Administration's (HCFA's) Office of the Actuary (OACT) provided data on expenditures for personal health care by source of payment. A study of State rate-setting conducted by Abt Associates, Inc. (1985) provided some background information on individual State Medicaid programs. A special study by HCFA's Health Policy Research Center at Brandeis University (Singer et al., 1986) provided data on developments in State Medicaid programs in the period coincident with the implementation of PPS. Data collected by the Blue Cross and Blue Shield Association and analyzed in a project sponsored by HCFA (Scheffler and Gibbs, 1986) provided the basis for a review of Blue Cross/Blue Shield utilization and payments. This project also provided information on payment methods used by the individual Blue Cross and Blue Shield plans and their involvement with alternative payment systems (Scheffler and Gibbs, 1987).

Research being conducted by staff at the Health Insurance Association of America (HIAA) and others (Gabel et al., 1986, Gabel et al., forthcoming, HIAA, 1986, McDonnell, 1986, Rice et al., forthcoming) provided information on commercial insurers and also preferred provider organization (PPOs). Finally, research conducted for HCFA by Abt Associates, Inc. (Korda, 1987) provided some information on development of alternative payment systems.

## Chapter Organization

This chapter begins with a brief discussion of the market for health insurance, based on changes in market shares. Recent changes in State

Medicaid programs are then described, in the context of policies being implemented at the Federal level. Trends in Blue Cross/Blue Shield utilization and expenditures are analyzed, and a description is presented of alternatives to fee-for-service that are being used by various individual plans. Recent changes being experienced by commercial insurers are then described. The chapter concludes with an examination of the recent growth of health maintenance organizations (HMOs) and other alternative payment systems.

### The Health Insurance Market

#### Distinctive Features

The market for health insurance has numerous features that distinguish it from markets for most other goods and services. First, conditions in this market depend on conditions in the market for health services, which is characterized by highly and increasingly differentiated products. In both the market for health services and the health insurance market, there is a substantial Government role, which includes the direct purchase of services as a third-party payer and the regulation of how services may be provided and insured for. The service and insurance markets may overlap, in that some organizations, such as HMOs, are both providers and payers for the health care services used by their clients. The insurance market is also characterized by substantial public subsidies, which some economists consider important determinants of market outcomes (Pauly, 1986). Finally, the insurance market may limit individual choice since most private health insurance is purchased by employers for groups of employees.

## Market Shares

Table 6.1 shows the growth in the private health insurance market and changes in market shares since the introduction of PPS. Private health insurance premiums increased by \$31 billion between 1983 and 1986, while total benefits incurred increased by \$24.9 billion. These figures reflect neither administrative costs nor insurer's investment income, so they do not permit a complete assessment of how the health insurance industry has fared since the implementation of PPS. However, they do indicate that the industry has been successful in covering increased health benefit costs with increased premium revenue.

Blue Cross/Blue Shield and commercial insurer market shares (in terms of premiums) have declined steadily since 1983 (from 34.3 percent to 31.7 percent for Blue Cross/Blue Shield and from 42.8 percent to 39.4 percent for commercial insurers), while self-insured plans and prepaid health plans have increased their shares (from 16.8 percent to 21.5 percent for self-insured plans and from 6.2 percent to 7.3 percent for prepaid health plans). Other data in Table 6.1 will be referred to later in this chapter.

## Sources of Payment for Hospital Care

Personal expenditures for hospital care grew relatively steadily in 1984 and 1985, at about 6 percent per year (see Table 6.2). In 1986, this growth rate increased to 7.4 percent. This increased growth was not evenly distributed across different payers.

Direct payments, for instance, grew at a relatively steady rate in 1984 (7 percent) and 1985 (5.8 percent), but this growth rate jumped in 1986 to

Table 6.1

PRIVATE HEALTH INSURANCE  
BY TYPE OF INSURANCE: PREMIUMS, BENEFITS,  
AND MARKET SHARES, 1983-1986

Type of Insurance:	Premiums Earned:		Total Benefits Incurred:													
	1983 Amount	Share	1984 Amount	Share	1985 Amount	Share	1986 Amount	Share	1983 Amount	Share	1984 Amount	Share	1985 Amount	Share	1986 Amount	Share
Total private health insurance	109.7	100.0	121.5	100.0	130.1	100.0	140.7	100.0	98.0	100.0	104.9	100.0	113.0	100.0	122.9	100.0
Blue Cross/Blue Shield	37.6	34.3	40.0	32.9	41.5	31.9	44.6	31.7	34.4	35.1	35.5	33.8	37.5	33.2	41.1	33.5
Commercial insurers	46.9	42.8	50.9	41.9	53.1	40.8	55.5	39.4	40.1	40.9	41.3	39.4	43.1	38.1	45.0	36.5
Group policies	27.1	24.7	26.6	21.9	27.3	21.0	28.2	20.0	22.8	23.3	20.6	19.6	21.4	18.9	22.3	18.1
Individual policies	4.6	4.2	5.3	4.4	5.8	4.5	6.3	4.5	3.1	3.2	3.6	3.4	3.9	3.5	4.2	3.3
Minimum premium plans	15.1	13.8	19.0	15.6	20.0	15.4	21.0	14.9	14.2	14.5	17.1	16.3	17.7	15.7	18.5	15.0
Self-insured plans	18.4	16.8	22.7	18.7	26.2	20.1	30.3	21.5	17.3	17.7	21.0	20.0	24.1	21.3	27.7	22.7
Prepaid health plans	6.8	6.2	7.9	6.5	9.4	7.2	10.3	7.3	6.2	6.3	7.0	6.7	8.3	7.3	9.1	7.3

Notes: Amounts in billions of dollars. Shares in percentage points.

Source: Health Care Financing Administration, Office of the Actuary, unpublished data.



Table 6.2

PERSONAL HEALTH CARE EXPENDITURES  
FOR HOSPITAL CARE  
BY SOURCE OF FUNDS, 1983-1986

Category:	1983		1984		1985		1986		1983	1984	1985
	Amount	Share	Amount	Share	Amount	Share	Amount	Share	Growth	Growth	Growth
Total	148.8	100.0	157.9	100.0	167.2	100.0	179.6	100.0	6.1	5.9	7.4
Direct payments	12.8	8.6	13.7	8.7	14.5	8.7	16.8	9.4	7.0	5.8	15.9
Third-party payments	136.1	91.5	144.2	91.3	152.7	91.3	162.8	90.6	6.0	5.9	6.6
Private health insurance	56.6	38.0	58.2	36.9	60.5	36.2	64.9	36.1	2.8	4.0	7.3
Other private funds	1.6	1.1	1.6	1.0	2.0	1.2	2.2	1.2	0.0	25.0	10.0
Government	77.8	52.3	84.3	53.4	90.2	53.9	95.7	53.3	8.4	7.0	6.1
Federal	60.6	40.7	65.6	41.5	72.0	43.1	76.5	42.6	8.3	9.8	6.3
Medicare	40.5	27.2	44.4	28.1	48.9	29.2	51.7	28.8	9.6	10.1	5.7
State and local	17.2	11.6	18.7	11.8	18.3	10.9	19.2	10.7	8.7	-2.1	4.9
Medicaid	12.9	8.7	14.1	8.9	14.9	8.9	15.8	8.8	9.3	5.7	6.0

Notes: Amounts in billions of dollars. Shares in percentage points.  
 ----- Growth rates of amounts presented by base year  
 and given in percentage points.  
 All Medicaid data are combined Federal, State, and local data.

Source: Levit (1985), p. 28; Health Care Financing Administration, Office of the Actuary, unpublished data.

15.9 percent. Thus, the share of hospital care costs paid by the patient increased to 9.4 percent in 1986, from 8.7 percent in the previous year. Private health insurance payments have increased steadily since 1983 (by 2.8 percent in 1984, 4 percent in 1985, and 7.3 percent in 1986), but the share of total hospital care costs accounted for by private insurers decreased from 38 percent in 1983 to 36.1 percent in 1986.

Federal Government payments for hospital care grew by 6.3 percent in 1986, but this was down from the 9.8 percent growth rate in the previous year (the growth rates for Medicare alone were 5.7 percent and 10.1 percent, respectively). Thus, while the share of hospital care costs paid by the Federal Government increased to 42.6 percent in 1986 from 40.7 percent in 1983, this represents a decrease from 43.1 percent in 1985 (the shares accounted for by Medicare alone were 27.2 percent in 1983, 29.2 percent in 1985, and 28.8 percent in 1986).

The change in State and local government payments for hospital care fluctuated substantially over the period of observation, from 8.7 percent in 1984 to -2.1 percent in 1985 and 4.9 percent in 1986. The share of hospital care costs paid by State and local governments fell to 10.7 percent in 1986, from 11.6 percent in 1983 and 10.9 percent in 1985. Medicaid payments for hospital care (State and Federal combined) have, by comparison, increased fairly steadily (by 9.3 percent in 1984, 5.7 percent in 1985, and 6.0 percent in 1986), and the share of hospital costs paid by Medicaid has been almost constant over the period of observation (8.8 percent in 1986 versus 8.7 percent in 1983).

### Medicaid Programs

Medicaid is a health program for the poor that is run by the States and jointly financed by the States and the Federal Government. The share of program cost borne by the Federal Government and some details of program operations, such as eligibility rules and services covered, vary by State. The Omnibus Budget and Reconciliation Act of 1981 (OBRA, Public Law 97-35) granted the States considerable discretion in details of program design, including payment methodology. Since 1981, a number of States have adopted prospective payment systems for Medicaid, an increasing number of which use methodologies based on diagnosis-related groups (DRGs). Although shifts from retrospective to prospective Medicaid payment were generally motivated by rising State Medicaid budgets (Hellinger, 1986), Medicare's PPS has served as a model for several States in designing their new Medicaid payment systems.

#### Payment Methods.

Prior to passage of OBRA in 1981, there were 40 State Medicaid programs using retrospective cost-based reimbursement to pay for hospital services (Abt Associates Inc., 1985). Since 1981, an increasing number of States have abandoned the previous Medicare principles of cost reimbursement, with a growing number implementing prospective systems. By April 1982, 14 States had prospective Medicaid systems; by September 1985, the number had increased to 33 and by August 1986, there were 36 States with prospective Medicaid systems. As of late 1986, at least 40 States and the District of Columbia had or were legislatively permitted to have prospective Medicaid systems and five more States were expected to adopt such systems in the near future.

Eleven models can be identified among the 36 States with prospective Medicaid systems. As shown in Table 6.3, they fall into two major categories:

o Twenty States set rates on a provider-specific basis. Of these:

- One requires competitive bids to set capitation payments;
- One negotiates budgets;
- One negotiates payments per case;
- Three negotiate per diem rates;
- Two set budgets;
- One sets payments per case;
- Eight set per diem rates; and
- Three set payments per DRG.

o Sixteen States set rates for peer groups of hospitals. Of these:

- Two set payments per case;
- Seven set per diem rates; and
- Seven set payments per DRG.

The ten States using DRG-based payment methods as of August 1986 represent an increase of two since September 1985. One additional State (Texas) has switched to DRG-based payment since August 1986 and eight others are expected to adopt DRGs, for a total of nineteen. States adopting DRG-based Medicaid payment systems after the implementation of Medicare's PPS generally modeled their systems on the Federal system, although most of these systems differ

Table 6.3

CATALOGUE OF STATE MEDICAID SYSTEMS  
WITH  
PROSPECTIVE PAYMENT

Unit of Payment	Payment System Model			
	Provider Specific			Peer Group Based
	Government Set	Negotiated	Competitively Bid	Government Set
Per Capita			Arizona	
Budget	Alaska	Rhode Island		
System	Massachusetts			
Per Admission/ Discharge	Maryland	District of Columbia		Nevada
				New Mexico
Per Day	Colorado *	California		Alabama
	Iowa	Illinois		Arkansas
	Florida	Vermont		Hawaii
	Kansas *			Kentucky
	Nebraska			Mississippi
	North Carolina			New York *
	Oklahoma			Virginia
	Tennessee *			
Per DRG	Michigan			New Jersey
	Minnesota			Ohio
	Washington			Oregon
				Pennsylvania
				South Carolina
				South Dakota
				Utah

Notes: \* - DRG system planned or under discussion.

----- In addition to the states listed, Texas just enacted a  
DRG-based system and Montana is considering enacting such  
a system.

Source: Singer (1986).

from Medicare's PPS in significant ways, such as their treatment of outliers or their provisions for the exclusion of certain classes of facilities.

#### Impact of Medicaid Prospective Payment on Expenditures

Preliminary analysis suggests that State adoption of DRG-based prospective payment for Medicaid is associated with moderation in the growth of or actual decline in the level of aggregate Medicaid expenditures, Medicaid length of stay, and expenditures per recipient (Hellinger, 1986). As with Medicare's PPS, neither admissions nor the rate of admissions per eligible person appears to have increased. However, since the evidence so far fails to take account of the numerous determinants of Medicaid expenditures other than the State's payment methodology, it is not possible to reach firm conclusions about the effectiveness of State DRG-based systems in controlling Medicaid inpatient hospital costs.

#### The Blue Cross and Blue Shield Plans

Blue Cross and Blue Shield plans account for about one-third of the market for private health insurance (as shown in Table 6.1 above). These plans have experienced significant cost and utilization changes in the period since the implementation of PPS. It is difficult to establish a clear causal link between the implementation of PPS and the Blue Cross/Blue Shield experience, since there have been numerous changes in recent years in the way that health care is provided and paid for. However, there are at least three ways in which Medicare changes could affect private insurers such as Blue Cross/Blue Shield.

First, changes in hospital and physician behavior in response to PFS may have "spillover" effects on non-Medicare patients. That is, to the extent that hospitals and physicians are unwilling or unable to distinguish between patients according to source of payment, the incentives provided by PFS may apply to all patients, rather than Medicare patients alone. Thus, other third-party payers may experience changes that are similar to those experienced by Medicare.

Second, in anticipation of efforts by hospitals to shift costs from Medicare to private patients under PFS, private insurers such as Blue Cross/Blue Shield may have felt pressure to protect themselves by initiating aggressive cost containment efforts. Thus, PFS may have served as an impetus for other third-party initiatives.

Third, the implementation of PFS may have served as a bellwether for private sector efforts to constrain the growth of health care costs. The dramatic change in the way that the Medicare program pays for hospital care may have eased the way for cost-containment initiatives by other third-party payers.

#### Payment Methods

Blue Cross/Blue Shield plans currently use numerous different payment methods, with individual plans occasionally reporting more than one method. Blue Cross/Blue Shield data indicate a modest shift among the 60 plans surveyed nationwide from primarily charge-based to primarily cost-based hospital payment. The number of plans with charge-based payment as the primary method decreased from 35 to 31 between 1981 and 1985, while the number of plans with cost-based payment increased from 25 to 29. At the same

time, there was a dramatic shift from retrospective to prospective payment among Blue Cross/Blue Shield plans. The number of plans with a primarily retrospective method of hospital payment decreased from 31 to 19 between 1981 and 1985, while the number with a primarily prospective method increased from 29 to 41.

### Utilization

The Blue Cross and Blue Shield Association has analyzed data for HCFA on Blue Cross/Blue Shield hospital utilization by subscribers under 65 years of age for 20 consecutive quarters from January 1, 1981 through December 31, 1985--11 quarters before the implementation of PPS and nine quarters after PPS began. The analysis includes 56 plans for outpatient data and 58 plans for inpatient data, separately examining the data for the States in which PPS was implemented during FY 1984 and the States that had waivers from the nationwide system (see Chapter 2).

As indicated in Table 6.4, the rate of change in inpatient utilization declined significantly between the pre- and post-PPS periods for the plans in PPS States. The rate of change in outpatient utilization, however, increased significantly in the PPS States. The sharp increase in the rate of growth of outpatient visits per member under PPS contrasts with the apparent decline in the growth rate reported in the previous annual report, which was based on an analysis of only 13 quarters of the same Blue Cross/Blue Shield data.

Waiver States were not directly affected by PPS, except insofar as Federal standards for the waivers affected incentives for State regulatory action. *Ceteris paribus*, then, the waiver States should show little or no pre/post differences due to implementation of PPS.



Table 6.4

UTILIZATION AND PAYMENT MEASURES  
FOR BLUE CROSS PLANS BEFORE AND  
AFTER IMPLEMENTATION OF PPS:  
AVERAGE ANNUAL PERCENT CHANGE FOR  
ALL BLUE CROSS PLANS, WAIVER STATE  
PLANS, AND NON-WAIVER STATE PLANS

Measure	All Plans		Waiver State Plans		Non-Waiver State Plans	
	Pre-PPS	Post-PPS	Pre-PPS	Post-PPS	Pre-PPS	Post-PPS
<u>Inpatient Utilization</u>						
Admissions/ 1000 Members	-1.8	-5.3***	0.7	-3.4***	-1.9	-6.2***
Average Length of Stay	-1.2	-2.2***	-2.1	-2.4***	-1.1	-1.9***
Days/ 1000 Members	-2.9	-7.5***	-1.5	-5.8***	-3.0	-8.1***
<u>Inpatient Payments</u>						
Payments/ 1000 Members	11.9	2.0***	13.0	5.0***	12.1	0.3***
Payments/ Day	14.9	9.5**	14.5	11.0	15.2	8.4***
Payments/ Admission	13.8	7.4***	12.3	8.5*	14.3	6.5***
<u>Outpatient Utilization</u>						
Visits/ 1000 Members	2.6	5.7***	2.1	0.7	3.3	8.1***
<u>Outpatient Payments</u>						
Payments/ 1000 Members	18.5	15.6**	16.7	11.2	19.6	17.9**
Payments/ Visit	15.9	9.8**	14.6	10.5	16.3	9.5**
<u>Total Payments</u>						
Payments/ 1000 Members	12.6	4.1***	13.4	5.9***	13.0	3.0***

Notes: Statistical significance: \* - 10% level, \*\* - 5% level, \*\*\* - 1% level  
 ----- Pre-PPS period includes quarters 1981:1-1983:3.  
 Post-PPS period includes quarters 1983:4-1985:4.  
 All rates are average of quarterly percent changes multiplied by  
 four to approximate annual percent changes. The percent changes were  
 computed using quarterly data seasonally adjusted using a four  
 quarter moving average.

Source: Scheffler and Gibbs (1986).

In fact, as Table 6.4 indicates, the waiver States showed statistically significant declines in inpatient utilization. This suggests that at least some of the pre/post change in the PPS States and in the nation as a whole may be due to non-PPS factors. Alternative explanations are that hospital and physician behavior changes motivated by PPS were emulated by hospitals not immediately affected by the new payment system, either in anticipation of extension of PPS to waiver States (as occurred in Massachusetts and New York in FY 1986) or as part of a general shift in attitudes and management practices in the hospital industry nationwide.

In contrast to the PPS States, however, the waiver States showed insignificant declines in outpatient utilization. This suggests that some PPS effect may have been felt by Blue Cross/Blue Shield, through the spillover of PPS-induced shifts from inpatient to outpatient care.

#### Payments

Growth in hospital inpatient payments per thousand Blue Cross/Blue Shield members slowed significantly between the pre-PPS and post-PPS periods for plans in the PPS States, as did payments per day and per admission (as shown in Table 6.4). The deflation of payments by the hospital services component of the consumer price index (CPI, not shown here) produced generally similar results, although the growth rate for deflated payments per day increased at a statistically insignificant rate (see Scheffler and Gibbs, 1986).

Table 6.4 also shows that growth rates in outpatient payments per thousand members and in payments per visit decreased significantly in the PPS States. However, the growth in deflated outpatient payments per thousand members increased significantly (see Scheffler and Gibbs, 1986).

### Commercial Insurance and Self-Insurance Plans

Commercial insurers accounted for 39.4 percent of private health insurance premiums in 1986 and self-insured plans for 21.5 percent (as shown in Table 6.1 above). This represents a modest decline for the commercials (from 42.8 percent in 1983) and a dramatic increase in self-insurance (16.8 percent in 1983) in recent years.

The most striking change in commercial insurance over the period between 1983 and 1986 is the decline of the traditional group policy line of business and the relative stability of the cost-reducing minimum premium plan line. Group policies accounted for a 24.7 percent share of the private health insurance market (as measured by premiums) in 1983; by 1986, this share had declined to 20.0 percent. On the other hand, the share of minimum premium plans grew slightly, from 13.8 percent in 1983 to 14.9 percent in 1986 (although this was down from 15.4 percent in 1985).

A 1986 survey by the HIAA indicates that even traditional commercial insurance has changed significantly in recent years. Approximately 20 percent of individuals with such insurance were covered by utilization review in 1986, compared to a reported 2 percent in 1984. Other signs of increasing cost containment activity on the part of commercial insurers are evident, such as the dramatic increase in managed care products offered by commercial insurers and even limited use of some DRG-based payment mechanisms (Gabel et al., forthcoming). This appears to be a response to increased competition in the private health insurance market.

The increase in the self-insurance market share has occurred as commercial and Blue Cross/Blue Shield shares have declined. A 1984 survey indicates that market share as measured by premiums or benefit payments may

understate the prevalence of self-insurance. This survey found that over 50 percent of the nation's employees with health insurance participate in self-insured plans, which are far more common at large firms than at small firms and other organizations (McDonnell et al., 1986). Since the increases in the self-insurance market share date back to at least 1982, they are more appropriately attributed to regulatory changes in the insurance market, responses to the increasing costs of purchased insurance, and increased competition than to the advent of PPS.

#### Alternative Payment Systems

The popularity of alternative payment systems has grown rapidly in the early 1980s. The market share (in terms of premiums) of prepaid health plans such as HMOs increased from 6.2 percent to 7.3 percent between 1983 and 1986 (as shown in Table 6.1 above). This reflects a cumulative increase in premiums of 51.5 percent over that period. Although the rate of growth in prepaid health plan premiums slowed somewhat in 1986, it still exceeded that of private health insurance in general and of all segments of the private health insurance market except for self-insured plans.

Perhaps more than for any other type of payer, caution is required in examining PPS effects on alternative payment systems. This market segment has changed drastically in recent years, reflecting changes in Federal legislation, new market participants, and great innovation in the types of organizations and arrangements in existence. However, there are several ways in which PPS might affect this group of payers.

First, HMOs participating in Medicare under increasingly common risk contracts are paid an amount reflecting the adjusted average per capita cost

(AAPCC), which is designed to reflect the cost of services to Medicare beneficiaries in the local fee-for-service market. As PPS encourages slower growth of fee-for-service provider costs, the AAPCC and thus payments to Medicare risk HMOs will grow more slowly. Second, implementation of PPS strengthens incentives for private sector cost containment activity for reasons discussed in connection with the Blue Cross/Blue Shield experience. Increased competition from fee-for-service providers could present HMOs with greater pressures, narrower profit margins, and stronger incentives to reduce hospital use per member even more.

#### Health Maintenance Organizations

The number of HMOs in the country approximately doubled between 1980 and 1985, while enrollment increased by 115 percent (Korda, 1987). These increases were largely accounted for by the increase in the number of independent practice association (IPA) and network model plans, which together accounted for 80 percent of the growth in HMO enrollment. By 1985, IPAs accounted for over half of the HMO plans in the country, up from 42 percent in 1980. IPAs are relatively small organizations, accounting for only 28 percent of national HMO enrollment in 1985, despite a 222 percent increase in membership since 1980. IPAs and network plans also account for two-thirds of the number of plans with Medicare risk contracts in 1985 and almost half of the Medicare enrollment in these plans.

## Preferred Provider Organizations

The newest form of alternative payment system is the PPO. PPOs are arrangements between purchasers and panels of providers, under which the providers offer discounted care with utilization review in return for economic incentives for subscribers to purchase services from them. Unlike HMO members, PPO subscribers may obtain care from other providers but incur higher costs if they do so.

PPOs, which first appeared in 1983, numbered over 300 by 1986. The number of people eligible to use them has increased from an estimated 1.3 million in December 1984 to 16.5 million in the summer of 1986. However, since eligibles may also use non-PPO providers, it is not known how many eligibles actually use PPO providers (Rice et al., forthcoming). About half of all PPO enrollment nationwide is concentrated in three States (California, Colorado, and Florida), with 39 percent in California alone.

Sponsors of PPOs include hospitals, physicians, Blue Cross/Blue Shield plans, commercial insurers, investors, and others. PPOs differ in size and type of cost containment activity, with provider-sponsored plans typically providing less comprehensive utilization review.

PPOs have also increasingly adopted DRG-based methods for payment of hospitals. A spring 1985 survey found that, although only 5 percent of PPOs that were in operation before June 1984 used DRGs, 27 percent of those established since then did (Gabel et al., 1986). As of mid-1986, 29 percent of the PPOs sponsored by Blue Cross/Blue Shield plans, 21 percent of investor-sponsored PPOs, and 18 percent of insurer-sponsored PPOs used DRG-based payment.

## Summary and Conclusions

During the period coincident with PPS implementation, many changes have occurred in the markets for health insurance and health care services. Although private health insurance benefit payments grew substantially between 1983 and 1986, private health insurance premiums grew more rapidly. Both Blue Cross/Blue Shield's and commercial insurers' market shares have decreased over that period, while self-insured plans and prepaid health plans account for an increased share of the health insurance market.

The shares of hospital care costs paid by private health insurers and by State and local governments decreased between 1983 and 1986, while the shares paid by Medicare and other Federal Government sources increased. The share of direct payments also increased. Most of the increase in direct payments occurred in 1986, while the shares of all other payers decreased or remained constant.

PPS may affect different payers in different ways, and the trends that have been observed may be attributed to PPS with varying degrees of confidence. State Medicaid programs have increasingly responded to budget pressures by adopting prospective inpatient hospital payment systems in general and DRG-based systems in particular. Medicaid DRG-based systems are clearly modeled on the Federal Medicare system. Blue Cross/Blue Shield plans have moved from primarily retrospective to primarily prospective methods of hospital payment between 1981 and 1985.

There were statistically significant declines in inpatient utilization growth rates, increases in outpatient utilization growth rates, and decreases in payment growth rates between the pre-PPS and post-PPS periods for Blue Cross/Blue Shield members under 65 years of age. Separate analyses of the

PPS and waiver States indicate that the trend in inpatient utilization is common to the two groups, but that the rapid growth in outpatient utilization is observed only in the PPS States.

Increased cost containment activity by commercial insurers, shifts to alternatives such as self-insurance, and growth of alternative payment systems such as HMOs and PPOs also characterize the PPS period. There is some evidence of use of DRG-based payment by PPOs. But these changes may be regarded as descriptive of the environment in which PPS was introduced and which it has helped shape, rather than as strong evidence that they are attributable to PPS.



## REFERENCES FOR CHAPTER 6

- Abt Associates, Inc. Innovations in Medicaid Hospital Reimbursement: Refining Prospective Payment Systems in the Eighties. Summary of State Programs, October, 1985. Unpublished report. Cambridge, Massachusetts: Abt Associates, Inc., November 1985.
- Gabel, J., Ermann, D., Rice, T., and deLissovoy, G. "The Emergence and Future of PPOs." Journal of Health Politics, Policy and Law, Vol. 11 (Summer 1986), p. 305-322.
- Gabel, J., Jajich, C., Williams, K., Loughran, S., and Haugh, K. "From Claims Payer to Prudent Purchaser: The Commercial Health Insurance Industry in Transition." Health Affairs, forthcoming.
- Health Insurance Association of America. "PPOs and the Changing Marketplace for Health Care." Research and Statistics Bulletin, No. 2-86, May 5, 1986.
- Hellinger, F.J. "Reimbursement Under Diagnosis-Related Groups: The Medicaid Experience." Health Care Financing Review, Vol. 8 (Winter 1986), p. 35-44.
- Korda, H. "Competition and the Response of Alternative Health Plans (AHPs): Impact of the PPS on AHPs and their Availability to Medicare and Non-Medicare Beneficiaries." Unpublished working paper. Cambridge, Massachusetts: Abt Associates, Inc., June 1987.
- Levit, K.R., Lazenby, H., Waldo, D., and Davidoff, L. "National Health Expenditures, 1984." Health Care Financing Review, Vol. 7 (Fall 1985), p. 1-35.
- McDonnell, P., Guttenberg, A., Greenberg, L., and Arnett, R. "Self-Insured Health Plans." Health Care Financing Review, Vol. 8 (Winter 1986), p. 1-16.
- Pauly, M.V. "Taxation, Health Insurance, and Market Failure in the Medical Economy." Journal of Economic Literature, Vol. 24 (June 1986), p. 629-675.
- Rice, T., deLissovoy, G., Gabel, J., and Gelzer, H. "Preferred Provider Organizations: Report of the 1986 National Survey." Inquiry, forthcoming.
- Scheffler, R. and Gibbs, J. "Blue Cross Primary Method of Hospital Payment and Alternative Delivery Strategies: Other Factors Affecting the Impact of the Prospective Payment System on the Private Sector." Unpublished working paper. Chicago, Illinois: Blue Cross and Blue Shield Association, June 1987.
- Scheffler, R. and Gibbs, J. "Blue Cross Utilization and Payment Rates Before and After Prospective Payment: December 1986 Update." Unpublished working paper. Chicago, Illinois: Blue Cross and Blue Shield Association, December 1986.
- Singer, J., Karon, S., Pendleton, S., and Bachman, S. "The Effects of Medicare PPS on Medicaid Programs." Unpublished working paper. Waltham, Massachusetts: Brandeis Health Policy Research Consortium, December 1986.

## Chapter 7

### IMPACT ON OTHER PROVIDERS OF HEALTH CARE

#### Introduction

##### Overview

Although the Medicare prospective payment system (PPS) directly affects only Medicare payments to hospitals, the incentives provided by PPS are expected to have an impact on decisions regarding the treatment of Medicare patients by other providers of health care--i.e., outpatient hospitals, physicians, nursing homes, and providers of home health care. In this chapter, the spillover effects that PPS may have are examined, in terms of both the financial impact on other providers and the impact on access to care as measured by trends in supply.

PPS incentives place increased emphasis on the provision of health care in the appropriate setting and decreases the previous emphasis on the hospital as the central locus of health care provision. This can be expected to result in increased use of outpatient hospital settings, physicians' offices, and other nonhospital settings for both medical and surgical procedures that were previously done on an inpatient basis. In addition, the emphasis on earlier discharge from the hospital can be expected to lead to a need for more post-acute care and a more complex mix of services in post-acute settings.

As is the case for all aspects of the evaluation of PPS, the many changes occurring in the health care system in recent years make it difficult to attribute the observed trends to any single policy initiative (see Chapter 2

for a discussion of the attribution problem). This problem is especially relevant to the analysis of the impact of FPS on physicians and the providers of post-hospital care, since these two components of the health care system have been changing extremely rapidly, due to changes in both the competitive and the regulatory aspects of the environments in which they operate. In addition, the data on services provided in nonhospital settings--and the outcomes of these services--are much more limited than the data available on the types, amounts, costs, and outcomes of inpatient services.

#### Data Sources

The analyses presented in this chapter are based on data from several sources. Data from the American Hospital Association's (AHA's) National Hospital Panel Survey were used for the analysis of total outpatient visits and charges. Data from Medicare bills for outpatient services were used to examine trends in Medicare utilization. The shift in medical and surgical services under Medicare Supplemental Medical Insurance (SMI or Part B) was analyzed using the Part B Bill Summary Records file, containing data from bills submitted for physician and supplier services for a 5 percent sample of the Medicare population. Data on the supply of post-acute care services were obtained from the Medicare Provider of Service file, which contains information on all providers that are certified to receive payment for Medicare services. A study funded by the Health Care Financing Administration (HCFA) and conducted by the University of Colorado provided data on trends in the case mix of patients receiving nursing home and home health care.

## Chapter Organization

The findings in this chapter are organized by type of provider. The first section describes revenue and utilization patterns for outpatient services, including a trend analysis of community hospital outpatient revenues. This is followed by an analysis of the structural changes in physician allowed charges by place and type of service. The discussion then turns to the supply of post-acute care providers, including skilled nursing facilities (SNFs), home health agencies (HHAs), and hospices, and the availability of Medicare-covered services. The chapter concludes with a discussion of the findings presented herein.

### Outpatient Hospital Services

As was noted in the previous annual reports (U.S. Department of Health and Human Services, 1985 and 1987), ambulatory care had been the fastest growing segment of the health care industry even before the advent of FPS. It continues to be the fastest growing sector, particularly for Medicare beneficiaries.

### Revenues

Using the AHA's National Hospital Panel Survey data for CY 1976 through 1986, trend analyses were conducted with time as the independent variable and community hospital revenue per visit and total outpatient revenue as dependent variables. These analyses indicated that, for 1984 and subsequent years, outpatient revenue per visit for community hospitals has grown at an

accelerated rate. Although Figure 7.1a suggests that community hospital outpatient revenue per visit has grown somewhat faster than what would have been predicted by the trend model, the actual value was not significantly different from the trend. Figure 7.1b indicates that total outpatient revenue grew at a rate very close to what would have been predicted by the model. Thus, FPS appears to have had no effect on gross outpatient hospital economic measures.

### Utilization

As shown in Table 7.1, there were slight declines in hospital emergency room and outpatient clinic visits for all patients in community hospitals and for Medicare patients in 1984, the first full year after the implementation of FPS. However, during 1985 and 1986, the volume of outpatient services began to increase once again. For all community hospital patients, the increases in emergency room and clinic visits were fairly small in 1985 (2.2 percent and 2.7 percent, respectively) and somewhat larger in 1986 (6.1 percent and 6.4 percent, respectively). The increases in emergency room visits for Medicare patients in 1985 and 1986 were much larger than they were for all patients (18.6 percent in 1985 and 11.4 percent in 1986), while the cumulative increase over the 2 years in Medicare clinic visits was about the same as the increase for all patients (9.3 percent for Medicare versus 9.2 percent for all patients).

The ratio of Medicare to total community hospital emergency room visits has increased between 1983 and 1986, from 7.5 percent to 9.1 percent, while the ratio of Medicare to total clinic visits has declined, from 13.7 percent to 13.1 percent.

FIGURE 7.1a  
COMMUNITY HOSPITAL OUTPATIENT REVENUE PER VISIT  
1976-1988

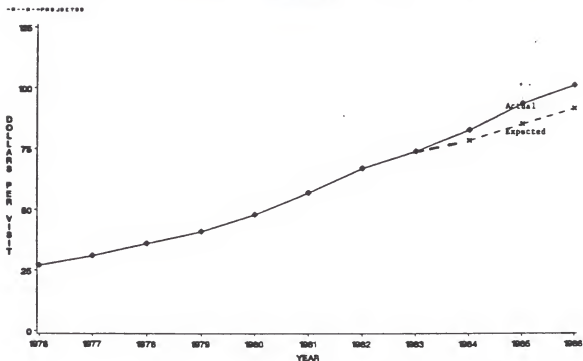


FIGURE 7.1b  
COMMUNITY HOSPITAL OUTPATIENT TOTAL REVENUE  
1976-1988

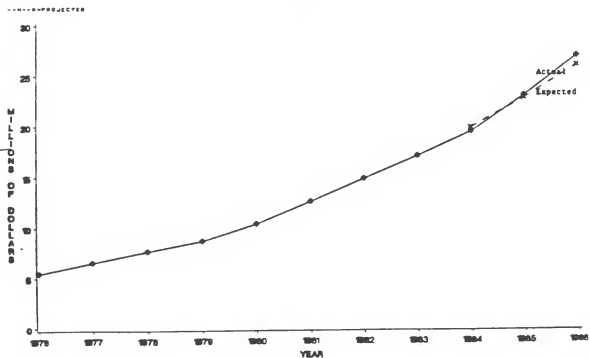


Table 7.1: Estimated Medicare Share of Total Community Hospital Clinic and Emergency Room Visits

	Visits in Millions Calendar Year				Percent Change		
	1983	1984	1985	1986	1983-84	1984-85	1985-86
<u>All Patients in Community Hospitals</u>							
Total AHA ER Visits <sup>a</sup>	79.2	78.8	80.5	85.4	-0.5	+2.2	+6.1
Total AHA Clinic Visits	42.9	41.1	42.2	44.9	-4.2	+2.7	+6.4
Total Other AHA Visits <sup>a</sup>	107.4	112.9	120.7	133.3	+5.1	+6.9	+10.4
<u>Medicare Patients<sup>b</sup></u>							
Total Medicare ER Visits	6.0	5.9	7.0	<del>6.9</del> 7.8	-1.2	+18.6	+11.4
Ratio of Total Medicare ER to Total ER Visits	0.075	0.075	0.087	<del>0.087</del> 0.091			
Total Medicare Clinic Visits	5.9	5.4	5.7	<del>5.6</del> 5.9	-7.6	+5.6	+3.5
Ratio of Total Medicare Clinic Visits to Total AHA Clinic Visits	0.137	0.132	0.135	<del>0.135</del> 0.131			

<sup>a</sup>The AHA community hospital data for the "Other Visits" category represents various diagnostic ancillary-service visits, i.e., x-ray, laboratory and blood tests. Medicare does not have a visit count directly comparable to the AHA "Other Visits Category." However, there were more Medicare patients who received benefits for hospital outpatient services "other than emergency room or clinic" (6.0 million in 1984 and 7.2 million in 1985) than who received benefits for "emergency room and/or clinic visits" (4.4 million in 1984 and 4.7 million in 1985).

<sup>b</sup>Excludes all persons under age 65 with end-stage renal disease.

SOURCES: HCFA: Bureau of Data Management and Strategy  
AHA: National Hospital Panel Survey

As can be seen in Figure 7.2, the most rapidly growing type of outpatient activity in community hospitals continues to be "other" visits. Visits in this category, which include visits for x-rays, laboratory tests, and blood work, increased from 120.7 million in 1985 to 133.3 million in 1986--a 10.4 percent increase. This indicates that community hospitals are increasing their use of outpatient departments for diagnostic ancillary services. The number of Medicare beneficiaries who received hospital outpatient department services "other than emergency room or clinic visits" (not shown in the table) also increased, from 6 million in 1984 to 7.2 million in 1985, while the number of beneficiaries making either emergency room visits or clinic visits increased from 4.4 million to 4.7 million.

#### The Shift in Service Settings

Medical and surgical services provided under Medicare Part B can be disaggregated by place of service, allowing the examination of shifts in Part B services from hospital inpatient settings to other Medicare provider settings. These services include only those provided by physicians and providers. Between 1982 and 1986, there have been substantial shifts in both medical and surgical Part B services that were previously furnished as inpatient hospital services into hospital outpatient departments, physicians' offices, and other ambulatory settings.

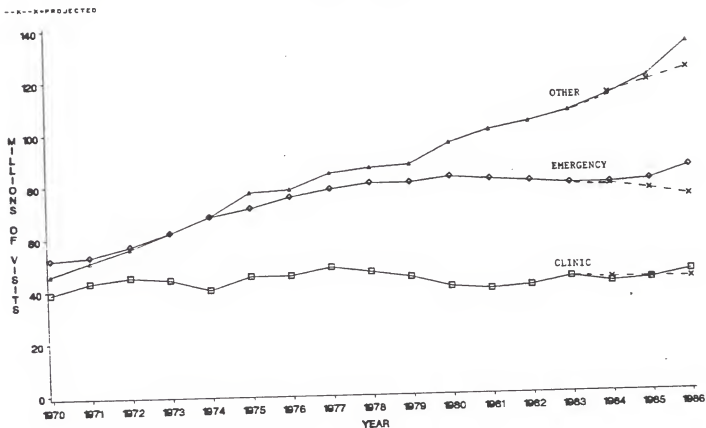
#### The Hospital Inpatient Setting

Table 7.2a shows that Part B medical services provided to hospital inpatients decreased from 41.3 percent to 31.2 percent of all medical



FIGURE 7.2

# OUTPATIENT UTILIZATION IN GENERAL COMMUNITY HOSPITALS 1970-1986



SOURCE: AHA NATIONAL HOSPITAL PARAL SURVEY, 1970-1986

Table 7a

LOCATION OF MEDICAL AND SURGICAL SERVICES  
PROVIDED UNDER MEDICARE SUPPLEMENTARY MEDICAL INSURANCE  
BY PERCENT OF SERVICES  
1982-86

DEPT

<u>Location</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>
Medical Care:	100.0%	100.0%	100.0%	100.0%	100.0%
Office	49.5	49.5	51.0	54.4	58.1
Inpatient hospital	41.3	40.5	37.8	34.8	31.2
Outpatient hospital	3.3	3.6	4.4	4.4	4.7
Other	5.9	6.4	6.8	6.4	6.0
Surgery:	100.0	100.0	100.0	100.0	100.0
Office	55.6	55.4	55.6	59.3	63.6
Inpatient hospital	32.7	31.9	30.1	25.0	19.8
Outpatient hospital	5.9	6.7	8.7	10.2	10.4
Other	5.8	6.0	5.6	5.5	6.2

Table 7a

LOCATION OF MEDICAL AND SURGICAL SERVICES  
PROVIDED UNDER MEDICARE SUPPLEMENTARY MEDICAL INSURANCE  
BY PERCENT OF REASONABLE CHARGES  
1980-86

<u>Location</u>	<u>1980</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>
Medical Care:	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Office	43.4	42.4	42.5	43.9	46.7	50.5
Inpatient hospital	48.2	49.5	49.0	46.5	43.3	39.4
Outpatient hospital	3.0	3.1	3.2	4.2	4.5	4.9
Other	5.3	5.0	5.3	5.4	5.5	5.2
Surgery:	100.0	100.0	100.0	100.0	100.0	100.0
Office	11.7	12.6	12.9	13.6	15.7	17.6
Inpatient hospital	84.4	81.9	79.6	74.2	63.6	57.0
Outpatient hospital	3.3	4.8	6.7	11.4	19.4	23.7
Other	0.5	0.7	0.8	0.9	1.3	1.8

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Note: 1984 and 1985 percentages have changed from those reported in the 1985 Impact report due to more complete data.

services between 1982 and 1986--a decrease of 10.1 percentage points. Moreover, this trend seems to have accelerated since the implementation of PPS in 1984--in 1983, the inpatient share of Part B medical services dropped by 0.8 percentage points, while, since 1984, the decrease in the inpatient share has averaged 3.1 percentage points. As shown in Table 7.2b, the percent of Part B reasonable charges for medical services in the inpatient setting has also decreased. This trend shows even more evidence of change under PPS--the inpatient share of Part B medical reasonable charges actually increased (by 0.8 percentage points) between 1980 and 1983, and then fell at an average of 3.2 percentage points per year between 1983 and 1986.

The decline in the share of Part B surgical services provided on an inpatient basis has been even more dramatic. The inpatient share of Part B surgical services fell from 32.7 percent in 1982 to 19.8 percent in 1986--a decrease of 12.9 percentage points. The inpatient share of Part B surgical reasonable charges also has declined sharply, from 84.4 percent in 1980 to 57 percent in 1986. Thus, while virtually all of the Part B charges for surgery on Medicare patients were generated in the hospital only a few years ago, only a bit more than half are being generated on an inpatient basis now.

#### The Hospital Outpatient Setting

Table 7.2a shows that the share of Part B medical services provided in hospital outpatient departments increased from 3.3 percent to 4.7 percent between 1982 and 1986--an increase of 1.4 percentage points. As shown in Table 7.2b, the outpatient share of Part B medical reasonable charges rose from 3 to 4.9 percent--1.9 percentage points--between 1980 and 1986.

More remarkable was the change in Part B surgical services and charges in the outpatient setting. The outpatient share of Part B surgical services rose from 5.9 percent in 1982 to 10.4 percent in 1986. The value of Part B surgical services provided on an outpatient basis rose from 4.8 percent to 23.7 percent of total Part B reasonable charges for surgical services between 1980 and 1986. The bulk of this increase has occurred since the implementation of PPS. Thus, the relative growth for the outpatient hospital component appears to be almost entirely composed of increases in surgical services and charges. Also, since charges for outpatient surgery are rising faster than the volume of services, it appears that more complex surgery may be being performed on an outpatient basis under PPS.

#### The Office Setting

The relative frequency of both medical and surgical services provided in the office setting has also risen rapidly under PPS. The proportion of Part B medical services provided in physicians' offices increased from 49.5 percent in 1982 to 58.1 percent in 1986 and the proportion of Part B surgical services provided in offices increased from 55.4 percent to 63.6 percent, as shown in Table 7.2a.

The increase in the value of medical and surgical services provided in physicians' offices followed a similar pattern. As shown in Table 7.2b, the share of Part B reasonable charges for medical services provided in offices increased from 43.4 percent to 50.5 percent between 1980 and 1986. This was the first time that over half of Part B medical service charges were generated in the office setting. During this same time period, the share of Part B reasonable charges generated by office-based surgery increased from 12.6 percent to 17.6 percent.

These shifts in the proportion of medical and surgical Part B services and reasonable charges from the inpatient to the outpatient and office settings are consistent with FPS incentives to provide health care in other provider settings, where clinically appropriate. Again, however, the difficulty in attributing these trends to FPS must be pointed out. In particular, the shift in surgical services from the inpatient to the outpatient setting may be due to advances in medical technology that allow these procedures to be performed safely without requiring the patient to remain in the hospital.

### Physicians' Services

Physicians' services comprise the largest component of care provided under Medicare Part B, accounting for some 70 percent of total Part B charges. This section contains an analysis of the distribution of Medicare allowed physician charges by setting and by type of service, in an attempt to learn more about the changing practice patterns of physicians under the recent changes in the Medicare program.

### Physician Charges

A dramatic change in the structure of physician charges under Medicare has been observed since the onset of FPS. As shown in Table 7.3, just over three-fifths of all Medicare allowed physician charges were related to inpatient services in 1982, while, by 1985, slightly less than half of Medicare physician charges were generated by inpatient care. This was the first time that inpatient care had accounted for less than half of Medicare

D. 10

Table 7.3

## Percentage Distribution of Medicare Physician Allowed Charges

by Place of Service: Calendar Years 1982-1985<sup>1</sup>

<u>Place of Service</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
Office	29.7	29.7	29.9	32.1
Inpatient Hospital	60.8	60.0	56.5	49.7
Outpatient Hospital	4.7	5.4	8.3	12.1
Other <sup>2</sup>	4.8	4.9	5.3	6.1

1/ Excludes charges for ambulance, durable medical equipment, purchases and rentals, and supplies. Includes charges for independent laboratory services.

2/ Includes home, nursing home, and other places of service.

Source: Health Care Spending Bulletin 86-02, USDHHS, HCFA, BDMS, OIS

physician charges. However, charges generated by inpatient hospital services continue to be the single largest component of physician charges.

The decrease in the inpatient share of Medicare physician charges was mostly offset by an increase in the share accounted for by services provided in hospital outpatient departments. Two-thirds of the decrease in the physician inpatient share was made up by an increase in the outpatient share, with the remaining one-third made up by the share accounted for by services provided in offices and other settings. These changes are consistent with the sharp reductions in Medicare hospital admissions and lengths of stay under PPS.

Figure 7.3a displays the pattern of Medicare allowed physician charges, disaggregated into charges associated with medical and surgical services. In 1982, 49.5 percent of Medicare physician charges for medical services were generated by services provided in the hospital. Between 1982 and 1985, the proportion of Medicare physician medical service charges associated with the inpatient setting decreased by 6.8 percentage points. The majority of this shift from the inpatient setting was to the physician's office. By 1985, the office was the single largest source of Medicare physician medical service charges, and the increase in charges generated by office-based medical services accounted for over three-quarters of the total shift in Medicare physician medical service charges. This pattern is consistent with the changes observed in the previous section.

As seen in Figure 7.3b, the relative proportion of Medicare allowed physician charges for surgery associated with the inpatient setting decreased by 19.1 percentage points between 1982 and 1985. About four-fifths of this reduction is accounted for by the increase in charges generated by outpatient surgery, with office-based surgery and surgery in other settings accounting

DRAFT

Figure 7.3a  
Distribution of Medicare Allowed Physician  
Medical Service Charges by Place of Service

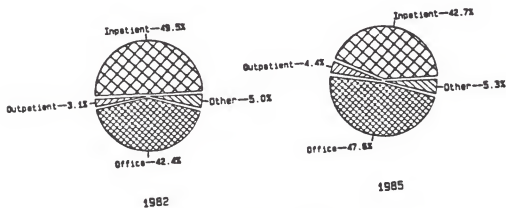
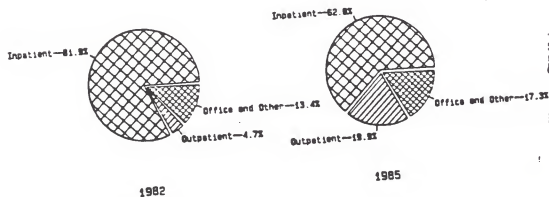


Figure 7.3b  
Distribution of Medicare Allowed Physician  
Surgical Charges by Place of Service





for the remaining portion. Despite these very significant changes, 62 percent of Medicare physician surgical charges are still being generated through the inpatient setting.

Although ambulatory care had been the fastest growing segment of the health care industry before the advent of PPS, the analysis above provides additional evidence that this trend has been more pronounced since the implementation of PPS.

### Long-Term Care Providers

#### Supply

Since the implementation of PPS, hospital lengths of stay have decreased. Decreased lengths of stay may result in the discharge of patients who are more likely to need post-acute care (also called post-hospital; sub-acute, or aftercare) services, such as the services delivered by SNFs, HHAs, swing bed facilities, and hospices. In this section, data are presented on the numbers of providers of these services, their staffing patterns, and types of patients served. Utilization of these services is discussed in Chapter 5.

There is substantial geographic variation in the availability of SNF and HHA services (see Tables 7.4 and 7.5). The implementation of PPS is only one of a number of factors which has influenced the supply of these services. Other important factors include State Medicaid reimbursement and eligibility policies and certificate of need laws.

Table 7.4  
AVAILABILITY OF CERTIFIED NURSING FACILITIES<sup>a</sup> BY STATE  
1981 AND 1985

State	1981			1985		
	Certified Facilities	Number of Beds	Beds per Thousand Medicare Enrollees	Certified Facilities	Number of Beds	Beds per Thousand Medicare Enrollees
Total	13,326	1,362,223	53.4	14,078	1,483,757	53.7
Alabama	206	20,742	47.5	212	21,555	46.1
Alaska	13	644	54.6	12	616	38.8
Arizona	25	3,217	10.4	46	6,003	16.2
Arkansas	207	19,574	63.8	221	21,381	65.8
California	1,184	114,468	47.7	1,198	111,671	42.0
Colorado	173	18,936	75.7	180	17,966	64.6
Connecticut	231	24,783	66.8	230	26,582	65.6
Delaware	26	2,789	45.9	34	3,823	55.4
Dist. of Col.	6	1,166	16.6	12	2,713	37.9
Florida	306	34,705	21.3	401	47,680	25.7
Georgia	301	30,649	59.9	319	32,971	58.2
Hawaii	34	2,516	32.4	34	2,634	27.9
Idaho	62	4,769	48.8	63	4,832	44.6
Illinois	687	90,107	71.7	700	90,743	68.4
Indiana	424	41,604	70.5	471	49,076	77.8
Iowa	427	34,118	87.1	444	35,816	88.3
Kansas	368	25,694	83.6	375	26,161	81.7
Kentucky	204	20,304	49.8	211	21,558	50.3
Louisiana	225	24,648	63.9	270	29,765	71.9
Maine	145	9,140	63.2	144	9,362	61.1
Maryland	174	20,909	53.5	192	23,597	53.9
Massachusetts	513	45,005	62.2	517	46,139	60.5
Michigan	421	46,275	49.4	426	50,297	49.8
Minnesota	454	46,335	95.0	468	49,094	95.7
Mississippi	143	12,294	43.3	153	13,911	46.8
Missouri	237	26,243	40.7	325	36,189	54.1
Montana	94	6,334	72.2	93	6,457	66.8
Nebraska	217	17,245	84.1	215	17,799	83.6
Nevada	26	2,269	32.6	29	2,574	28.5
New Hampshire	74	6,740	63.7	70	6,794	59.2
New Jersey	233	32,232	37.2	260	37,059	39.5
New Mexico	43	3,565	30.1	58	5,449	40.3
New York	570	94,124	44.0	595	99,667	45.2
No. Carolina	202	21,722	35.8	225	23,497	34.4
No. Dakota	83	6,570	79.3	82	6,843	78.7
Ohio	856	70,799	59.8	916	81,659	64.2
Oklahoma	363	28,330	77.3	367	29,318	76.1
Oregon	178	14,868	48.1	181	15,173	44.1
Pennsylvania	556	68,969	44.7	630	81,624	49.1
Rhode Island	106	8,545	67.5	109	9,463	69.8
So. Carolina	123	10,880	37.8	132	13,294	40.5
So. Dakota	114	7,880	84.9	115	8,165	84.4
Tennessee	229	24,540	47.9	249	28,087	50.7
Texas	976	100,059	74.4	968	98,592	67.1
Utah	80	5,214	46.5	77	5,592	44.1
Vermont	44	2,982	50.3	44	3,093	49.2
Virginia	163	20,428	40.6	178	25,257	44.8
Washington	262	24,872	56.7	275	33,123	67.4
West Virginia	74	5,721	24.2	91	7,979	32.0
Wisconsin	438	53,617	92.7	433	52,616	86.1
Wyoming	26	1,904	49.2	28	2,149	51.2

<sup>a</sup>Certified as Medicare SNF, Medicaid LCF/SNF, or both.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 7.5 Nurses<sup>1</sup> Employed by Participating  
Home Health Agencies and Enrollees per Nurse by Census Division: 1985

Census Division	Nurses Employed	Enrollees per nurse <sup>2</sup>
	<u>1985</u>	<u>1985</u>
United States	41,930	726
New England	3,347	529
Middle Atlantic	6,691	788
East North Central	5,820	917
West North Central	3,381	735
South Atlantic	6,475	829
East South Central	3,446	580
West South Central	4,144	691
Mountain	1,619	842
Pacific	7,008	564

1 Comprises registered professional and licensed practical nurses.

2 A lower ratio of enrollees per nurse indicates greater supply of nursing staff providing home health services.

## Nursing Homes

The number of Medicare-certified SNFs has grown steadily since 1981 (Table 7.6). Before 1986, the number of facilities had increased largely due to application for certification by existing units, rather than by construction of new ones. Between 1985 and 1986, the increase of 7.8 percent was due almost equally to conversions and new construction.

With the increase in Medicare-certified facilities, access for Medicare patients may have improved. In some areas, there appear to have been concentrated efforts to increase the number of certified facilities. Over 40 percent of the increase in the number of certified facilities between 1985 and 1986 was due to the considerable increase in Region VI (Arkansas, Louisiana, New Mexico, Oklahoma and, most notably, Texas). The number of Medicare-certified facilities in this region increased from 130 to 360. In Texas alone, the increase was from 63 to 221. However, Medicare-certified facilities are still heavily concentrated in a few States. In 1986, over 40 percent (2,895) of the 6,972 facilities were located in five States: California (1,007), Pennsylvania (522), New York (562), Ohio (458) and Florida (346).

Beds in Medicare-certified facilities are a subset of total certified beds (certified for Medicare, Medicaid, or both). In recent years, there has been an increase in the number of beds in facilities certified for Medicare, Medicaid, or both (see Table 7.4), but a decrease in the number of beds in facilities certified for Medicare only (Table 7.6). However, the number of Medicare-certified SNFs, rather than the number of beds in these facilities, is considered a better indicator of access. This is due to the fact that the problem for beneficiaries is more likely to be finding a nursing home

Table 7.6

GROWTH IN NUMBER OF MEDICARE AND TOTAL CERTIFIED SNFS AND BEDS  
1981-86

	<u>Medicare Certified Facilities</u>	<u>Annual Percent Change</u>	<u>Medicare Certified Beds</u>	<u>Annual Percent Change</u>	<u>Total Certified Beds*</u>	<u>Annual Percent Change</u>
May 1981	5,197	---	457,674	---	610,742	---
May 1984	5,908	+ 4.4%	527,407	+15.2%	705,392	+ 4.9%
Dec 1985	6,423	+ 5.5	478,042	- 5.9	762,527	+ 5.1
Nov 1986	6,972	+ 7.8	444,985	- 6.3	820,199	+ 6.9

\*Medicare and/or Medicaid.

Source: Health Care Financing Administration, Office of Research and  
 Demonstrations.

certified for Medicare than it is whether a Medicare-certified nursing home has a bed available for them, since the Medicare occupancy rate for beds in Medicare-certified facilities tends to be very low. The fact that there was an increase in the number of Medicare-certified facilities indicates that Medicare beneficiaries probably have had less difficulty in recent years locating facilities where they could receive covered SNF care.

Although this report focuses primarily on Medicare covered services, it should be noted that all Medicare patients discharged from hospitals may not meet the stringent criteria for Medicare covered SNF care, and yet they may need some SNF care upon discharge. The increase in the total number of facilities certified for Medicare, Medicaid, or both may thus be due in part to greater demand for all post-acute care created by the earlier discharge of Medicare patients under PPS.

In the past, most SNFs have not been geared to the type of short-term skilled or rehabilitative care frequently required by Medicare patients. Many SNFs have not have found it to their advantage to become certified for Medicare, in view of the small number of Medicare patients they expected to serve and the limited number of days that would be covered. It is possible that, since PPS has been found to have resulted in a greater number of post-acute SNF patients (see Chapter 5), both covered by Medicare and by other sources (private pay, Medicaid, other insurance), SNFs may be responding by changing their staffing and the types of services provided to accommodate patients needing sub-acute care.

Georgetown University, in a study sponsored by HCFA, is currently conducting a survey of nursing facilities to examine changes in staffing and services offered as a result of PPS. Results are due in late 1987. Data from a University of Colorado study on the types of patients being served in nursing homes pre- and post-PPS are presented later in this chapter.

Between 1981 and 1984, the number of hospital-based facilities that were certified for Medicare and/or Medicaid increased from 761 to 1,004 (32 percent). This growth in hospital-based facilities may improve access for Medicare beneficiaries, since these facilities account for a high proportion of Medicare patient days relative to their numbers. Having a hospital-based SNF could be beneficial to the hospital, because it may assist in the ability to discharge patients as soon as their medical conditions allow. This arrangement diminishes the problem of finding appropriate placements for patients in post-acute settings.

#### Home Health Agencies

The number of Medicare-certified HHAs has grown significantly since 1983, increasing from 4,258 to 5,953 by 1986 (Table 7.7). The greatest percentage increases over this time period were in 1983 and 1984 (17 percent and 23.9 percent, respectively). In 1985, the increase was 12.5 percent and in 1986, the increase in the number of HHAs had leveled off to only 0.4 percent.

Table 7.8 shows that the number of hospital-based HHAs increased almost sixfold from 1972 to 1986 (from 231 to 1373). In particular, there has been a large increase in the number of hospital-based HHAs since PPS started, with the number more than doubling between 1983 and 1985, from 579 facilities to 1,260 facilities. Similarly, the number of SNF-based HHAs increased significantly from 1972 to 1985. Between 1983 and 1984, the number of these agencies grew from 136 to 175 (an increase of 29 percent), but since that time it has decreased. In 1985, there were 129 SNF-based HHAs and in 1986, this number had fallen to 110--only 63 percent of the 1984 total.

Table 7.7

GROWTH IN NUMBER OF MEDICARE CERTIFIED HHAs  
1972-86

<u>Year</u>	<u>Medicare Certified HHAs</u>	<u>Percent Change<sup>a</sup></u>
1972	2,212	---
1977	2,496	+ 2.6%
1979	2,858	+ 7.3
1982	3,639	+ 9.1
1983	4,258	+17.0
1984	5,274	+23.9
1985	5,932	+12.5
1986	5,953	+ 0.4

Source: Health Care Financing Administration, Office of Research and Demonstrations.



Table 7.8  
Medicare Certified Home Health Agencies by Ownership :1972-1986

Type of Ownership	<u>1972<sup>1</sup></u>		<u>1983<sup>1</sup></u>		<u>1985<sup>1</sup></u>		<u>1986<sup>1</sup></u>	
	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>
Visiting Nurse Association	531	24.0	520	12.2	518	8.7	500	8.5
Combined Voluntary/ Government	55	2.5	58	1.4	57	1.0	61	1.0
Government	1255	56.7	1230	28.9	1217	20.4	1165	19.8
Rehabilitation Facility- Based	11	0.5	22	0.4	20	0.3	15	0.3
Hospital- Based	231	10.4	579	13.6	1260	21.1	1373	23.3
SNF-Based	7	0.3	136	3.2	129	2.2	110	1.9
Proprietary	43	1.9	997	23.4	1927	32.3	1871	31.7
Private Non- Profit/Other	79	3.6	719	16.9	836	14.0	800	13.6
Total	2212	100.0	4258	100.0	5964	100.0	5895*	100

<sup>1</sup> As of December 31.

\*Data on the auspices of 58 HHA's was not available.

Source: HCFA Provider of Service File

Examination of the data on hospital- and SNF-based home health care is considered particularly important due to the ready access that these providers have to patients needing HHA care. Operation of an HHA could be particularly advantageous for hospitals that have incentives for decreasing hospital lengths of stay. Many patients would not qualify for SNF care, so providing HHA care under the hospitals' auspices could solve problems relating to discharge planning for needed post-acute care services. This could be financially beneficial to the hospital, as well, since it would receive cost-based Medicare home health payments for these patients. In effect, hospitals could substitute home health services in place of what would otherwise have been the last few days of hospital recovery.

In addition to the changes in the numbers of HHAs since PPS, there have been changes in HHA staffing and the types of services provided. Between 1982 and 1984, the average number of full-time equivalent personnel employed by HHAs increased by almost 50 percent, from 19.2 to 29.7 (Table 7.9). However, in 1985, average staffing levels decreased in all categories, with the total average staffing dropping to 18.7. In 1986, this number decreased further, to 17.5 per agency.

It would appear from these data that HHAs employed greater numbers of personnel immediately after PPS, but that they did not find it to their advantage to maintain larger staffs. It is possible that many HHAs decided instead to rely on part-time staff to meet their clients' needs. This view is supported by data on the change in the proportion of HHAs offering various types of home health services. All HHAs must offer skilled nursing services to their patients in order to be certified by Medicare. Most offer at least one or two other services. Between 1982 and 1985, the proportions of HHAs providing various types of in-home services have increased. The most

HHA STAFFING LEVELS BY SPECIALTY  
1982 - 1986

Average FTE Personnel

<u>Specialty</u>	<u>1982</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>
Registered Nurse	7.1	7.6	6.7	6.5
Licensed Practical Nurse	0.9	3.5	1.0	0.6
Physical Therapist	1.1	2.4	1.3	1.1
Occupational Therapist	0.4	1.5	.8	0.3
Speech Pathologist/ Audiologist	0.6	2.6	1.2	0.5
Home Health Aide	4.8	6.3	4.9	4.4
Other	4.3	5.8	2.8	4.0
TOTAL:	19.2	29.7	18.7	17.4

Source: Health Care Financing Administration, Office of Research and Demonstrations.

Table 7.10

CHANGE IN PROPORTION OF HOME HEALTH AGENCIES  
PROVIDING VARIOUS TYPES OF IN-HOME SERVICES  
1982-86

<u>Type of Service</u>	<u>January 1982</u>		<u>December 1986</u>		<u>Percent Change</u> <u>Proportion</u>
	<u>Number</u>	<u>Proportion</u>	<u>Number</u>	<u>Proportion</u>	
Skilled Nursing	4,270	100.0%	5,901*	100.0%	0.0%
Physical Therapy	3,546	83.0	5,221	88.5	+ 6.6
Occupational Therapy	2,104	49.3	3,496	59.2	+20.1
Speech Therapy	2,793	65.4	4,360	73.9	+13.0
Medical Social Services	2,255	52.8	3,594	60.9	+15.3
Home Health Aides	4,036	94.5	5,727	97.1	+ 2.8
Interns and Residents	32	0.8	79	1.3	+62.5
Nutritional Guidance	1,016	23.8	1,666	28.2	+18.5
Pharmaceutical Service	272	6.4	604	10.2	+59.4
Appliances and Equipment	983	23.0	1,215	20.6	-10.4

\*Data for 52 HHA's was not available.

Source: Health Care Financing Administration, Office of Research and Demonstrations.

dramatic increases have occurred in the proportion offering pharmaceutical services, occupational therapy, and nutritional guidance (see Table 7.10). These data indicate, therefore, that at the same time that average staffing levels had gone down in HHAs, the proportion offering various services was going up.

#### Swing-Bed Hospitals and Hospices

There are two other long-term care settings into which hospitals may discharge their patients under Medicare. Both are relatively new programs, and have grown rapidly since their establishment. The national swing-bed program, which became effective in July 1982, allows rural hospitals with fewer than 50 beds to receive reimbursement for long-term care provided in acute care beds. The number of such hospitals approved for swing-bed care increased from 149 to 956 between 1983 and 1986 (see Table 7.11). This number represents about 16 percent of all hospitals in the U.S. Four States account for more than one-third of all the approved swing-bed hospitals: Iowa (91), Kansas (80), Minnesota (86), and Texas (79). In a study that is discussed in the next section of this chapter, researchers at the University of Colorado noted that Colorado long-term care patients in hospital swing beds are characterized by more sub-acute problems than those in regular nursing homes.

The Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA, Public Law 97-248) authorized the reimbursement of covered services in facilities independently certified as hospice providers. The number of hospices certified for Medicare grew from 76 in 1983 to 355 in 1986 (see Table 7.12). Hospices tend to be concentrated in certain geographical areas--most are located in the South or Midwest.

Table 7.11 Growth in Number of Hospitals Approved for Swing Bed Care

<u>Year</u>	<u>Hospitals</u>	<u>Percent Change</u>
1983	149	---
1984	471	+216.1%
1985	771	+63.7%
1986	956	+24.0%

---

Swing bed program effective July 1982; only hospitals in a non-urbanized area with fewer than 50 beds in use are eligible.

Source: University of Colorado, Contract No. HCFA-500-83-0051 "National Swing Bed Program Evaluation"

Table 7.12 Growth in Number of Medicare Certified Hospices

<u>Year</u>	<u>Hospices</u>	<u>Percent Change</u>
1983	76	---
1984	153	+101.3%
1985	227	+ 48.4%
1986	355	+ 56.4%

---

Hospice program effective November 1983

Source: HCFA Provider of Service File

### Patients Served by Long-Term Care Providers

The University of Colorado's Center for Health Services Research examined long-term care case mix before and after the implementation of PPS in four patient-level samples, including three samples of nursing homes and one of home health agencies. This research studied case mix, quality, and cost in hospital-based and freestanding nursing homes and HHAs in ten States (Shaughnessy et al., 1987).

One of the nursing home samples was composed of "high-Medicare SNFs" in six States--i.e., SNFs in which Medicare covered approximately 30 percent of the total patient days of care. These are the facilities most likely to offer short-term skilled and rehabilitative care. This sample was analyzed separately because it was felt that these facilities, which provide the bulk of the care to Medicare patients, would differ considerably from "traditional nursing homes."

"Traditional nursing homes" were defined for purposes of this study as nursing homes with a mix of intermediate care and skilled nursing beds and patients and are certified for Medicaid and possibly Medicare. These facilities are characterized by relatively high proportions of Medicaid and private pay patients, and almost all have fewer than 10 percent of their patient days covered by Medicare. Most had no more than 3 or 4 percent of their total days covered by Medicare in 1986.

It was hypothesized that, since PPS encouraged shorter hospital stays, there would be an increase in patients with more sub-acute care needs receiving care in nursing homes, particularly in high-Medicare SNFs and HHAs.

The results for high-Medicare nursing homes suggest that, not surprisingly, these facilities may be the most fundamentally affected by

PPS. In general, the sub-acute care needs of patients in high-Medicare nursing homes increased substantially between 1983 and 1986. This increase in sub-acute case mix intensity appears largely attributable to Medicare long-term care patients admitted after PPS was implemented. At the same time, the increase in the prevalence of chronic long-term care problems and levels of dependency in activities of daily living (ADL) was relatively minimal in high-Medicare SNFs. Thus, the high-Medicare SNFs appear to be specializing more in supplying sub-acute care than was the case prior to PPS. Perhaps because of this increased specialization in sub-acute care--and the resultant diversion of more chronically ill patients to traditional nursing homes--increased functional and chronic problems were observed in traditional nursing home patients. This increase in sub-acute case mix intensity may also be the result of more stringent Medicaid admission policies for institutional long-term care across the country and the increased diversion of nursing-home eligibles who are less functionally impaired to home health care.

According to Shaughnessy and Kramer, the diversion of patients with less intense sub-acute needs to traditional nursing homes could occur as a result of several concurrent factors, including physician assessment of the capabilities of the nursing homes available to admit a given patient, nursing home admission policies, and other considerations related to the specific case. The data suggest that such diversions are taking place, as does anecdotal information obtained throughout the course of this study from physicians, nursing home administrators, nursing home staff, and hospital discharge planners.

Another strong direct impact of PPS appears to have been on the providers of home health care. Not only did several sub-acute case mix indicators

increase between 1982 and 1986 for HHAs in the 10-State home health sample, but functional and more chronic long-term care indicators increased substantially and almost uniformly. These increases appear to be due almost exclusively to increased casemix intensity for Medicare rather than non-Medicare patients.

The greater case mix intensity associated with physical/ADL functioning for HHAs is a combined effect of PPS and the efforts of Medicaid programs to divert certain types of long-term care patients from nursing homes. In this respect, the national movement by Medicaid programs to tighten their preadmission screening process for nursing homes and increase the functional support services available to clients in the community (through home and community-based waiver programs) very likely has had the effect of diverting certain types of potential Medicaid nursing home admissions to home health care. Such patients previously may have been institutionalized, although with fewer functional disabilities than most nursing home patients. Nonetheless, when retained in the community and provided home care, they would tend to be more functionally disabled than the typical home care patient.

Somewhat surprising was the finding that home health patients were admitted less frequently from hospitals and more frequently from home in 1986 relative to 1982. Shaughnessy and Kramer believe this is due to several factors. First, it may be a result of certain types of procedures, such as outpatient surgical procedures, now being performed with home health follow-up. In general, this reflects the desirability and potential utility of home health services as a means of avoiding certain types of hospitalizations. Second, in view of what appears to be a relatively high demand for Medicare SNF care in high-Medicare nursing homes, the likelihood



that Medicare and possibly even non-Medicare patients are discharged from such nursing homes with home health follow-up may have increased. Third, for discharges from nursing homes and even from acute care, it is possible that the patient is not necessarily discharged home with home health care at the time of discharge. Rather, it may take 1 or 2 weeks before the need for home health care is apparent. In this case, the HHA would admit the patient from home, rather than from an institutional setting, despite the fact that the home health admission would occur shortly after the discharge from nursing home or hospital.

#### Summary and Conclusions

Although it directly affects only hospital incentives, PPS appears to have had a definite effect on other providers for health care. There has been a sharp acceleration in the shift of Medicare covered services from the inpatient setting to the outpatient, office, and other settings. In particular, medical services seem to be shifting primarily to the office setting, while surgical services are shifting toward the outpatient setting. Moreover, the apparent complexity of surgery being performed in the outpatient setting is increasing rapidly.

Since the implementation of PPS, the supply of post-acute care providers has increased. Some of this increase may be due to the increased demand for post-acute care brought about by the earlier hospital discharge of Medicare patients. It may also be due in part to demographic factors (including the aging of the population), changes in States' Medicaid eligibility and reimbursement policies and, in the case of home health care, to changes in home health coverage under Medicare and to efforts to use home and

community-based services wherever possible to avoid premature or inappropriate institutionalization.

The number of Medicare-certified SNFs has increased in the period following PPS. A University of Colorado study of nursing homes in 10 States indicated that, in homes that served a large proportion of Medicare patients prior to PPS, the sub-acute care needs of patients increased in the post-PPS period. It appears that these high-Medicare homes made room for more sub-acute care patients by transferring patients with more chronic long-term care conditions and numerous functional limitations to the more traditional nursing homes.

The number of HHAs also has increased during this time period. Although part of this increase is believed to be due to changes in Medicare home health coverage legislated in the Omnibus Reconciliation Act of 1980 and to changes in State Medicaid coverage policies, the increased supply of home health services is complementary to the objectives of PPS, in allowing for the provision of sub-acute care in more appropriate settings.

The University of Colorado study found that home health patients in the post-PPS period had both increased sub-acute care needs and more functional and chronic long-term care needs. While this increase in case mix intensity may have been partly due to the implementation of PPS, it was also a result of the diversion of patients from nursing homes as a result of increased preadmission screening and case management programs.

In the period immediately following PPS, HHAs increased their average staffing levels. However, the average size of HHA staffs has since decreased to below the 1982 level. At the same time that staffing was decreasing, however, the proportion of HHA's offering various types of services was increasing.

The supply of both swing beds and hospices, both relatively new programs, increased substantially since PPS was instituted. It is not possible to say to what extent this growth was due to PPS. We do know that both of these programs tend to be concentrated within certain geographical areas.

## REFERENCES FOR CHAPTER 7

Shaughnessy, P., Kramer, A., and Pettigrew, M. "Findings on Case Mix and Quality of Care in Nursing Homes and Home Health Agencies." Unpublished working paper. Denver, Colorado: University of Colorado Center for Health Services Research, July 1987.

U.S. Department of Health and Human Services. Report to Congress: The Impact of the Medicare Hospital Prospective Payment System, 1984 Annual Report. Washington, D.C.: 1985.

U.S. Department of Health and Human Services. Report to Congress: The Impact of the Medicare Hospital Prospective Payment System, 1985 Annual Report. Washington, D.C.: 1987.

Chapter 8  
IMPACT ON MEDICARE PROGRAM OPERATIONS AND EXPENDITURES

Introduction

Overview

Chapters 3 through 7 have presented evidence on the impact of the Medicare prospective payment system (PPS) on hospitals, Medicare beneficiaries, the utilization and quality of post-hospital care, other payers for inpatient hospital services, and other providers of health care. In accordance with the congressional mandate cited in Chapter 1, these chapters address the effect of prospective payment on each of the major groups of individuals or institutions that use, provide, and pay for health care in this country, with the exception of the Medicare program itself. This chapter is devoted to a description and analysis of the changes in the Medicare program that have occurred as part of or because of the implementation of PPS.

The impact of any new system depends to a great extent on the ability to implement the system with a minimum of disruption and uncertainty. As carefully designed as a system may be, its success may be limited if its operational aspects do not proceed smoothly. For this reason, several operational aspects of the Medicare program vis a vis PPS are discussed in this chapter.

Also, it must be remembered that the primary concern that led to the implementation of PPS was the need to constrain the depletion of the Medicare Trust Funds, so that the Medicare program could avoid the insolvency that was

predicted by as early as the end of the decade. This chapter, then, also examines the impact of prospective payment on Medicare expenditures, to determine the success of the new system in achieving the purpose for which it was enacted.

### Data Sources

Data on the number of hospitals covered and not covered under PFS were provided by the Health Care Financing Administration's (HCFA's) Bureau of Data Management and Strategy (BDMS). These data are derived primarily from the Provider of Service File, which contains information on each institutional provider certified to receive Medicare payment. The examination of denial rates by Medicare Fiscal Intermediaries (FIs) and Utilization and Quality Control Peer Review Organizations (PROs) is based on data provided by HCFA's Health Standards and Quality Bureau (HSQB), which is responsible for monitoring the PRO contracts. These data were analyzed by Abt Associates, Inc., in a project funded by HCFA (Hassol, 1987).

The analysis of trends in Medicare program expenditures is based on estimates of incurred Medicare benefit payments by type of provider, computed by HCFA's Office of the Actuary. Estimates of incurred Medicare benefit payments are used rather than actual cash outlays because administrative decisions and other factors that affect the flow of funds may be reflected in the data on cash outlays, while this report is more concerned about the true effects of programmatic changes on the volume of payments for which Medicare is responsible. In any case, the disaggregation of the data by type of provider would need to be estimated, since data on cash outlays by type of provider are not available. Since these figures are estimates, they are

subject to revision, and thus may be slightly different from the figures contained in the previous annual report (U.S. Department of Health and Human Services, 1987).

### Chapter Organization

This chapter begins with a discussion of the extent to which the nation's hospitals are participating in prospective payment, to provide a context in which to appreciate the scope of the new system. Then, two aspects of program operations are considered: the FIs that process Medicare hospital claims, audit Medicare hospital cost reports, and determine the coverage status of billed services and the PROs that monitor the appropriateness, necessity, and quality of hospital care under PFS.

The remainder of the chapter describes and analyzes trends in incurred Medicare benefit payments since the beginning of the program, with an emphasis on the comparison of rates of change prior to and since the implementation of PFS.

### Program Operations

#### Hospital Participation

Table 8.1 shows the status of Medicare hospitals under PFS, as of the end of each fiscal year. There were 5,657 hospitals being paid under the new system at the end of FY 1986, comprising some 84 percent of all Medicare hospitals. This figure was up by 314 over the previous year, due to the inclusion of hospitals in Massachusetts and New York in the national system

Table 8.1

STATUS OF MEDICARE HOSPITALS UNDER THE PPS  
FY 1984-86

Status	Number of Hospitals <sup>a</sup>		
	As of Sept. 30, 1984	As of Sept. 30, 1985	As of Sept. 30, 1986
Paid Under PPS	5,405	5,343	5,657
Waiver States:	552	545	166
o Maryland	57	56	56
o Massachusetts	119	118	0
o New Jersey	96	96	96
o New York	280	275	14 <sup>b</sup>
Outlying Areas (Puerto Rico, Virgin Islands, Guam, American Samoa):	58	59	61
Categorically Excluded Hospitals:			
o Psychiatric	439	481	515
o Rehabilitation	49	68	79
o Alcohol/Drug	25	28	22
o Long-term	83	86	92
o Children's	47	53	55
Categorically Excluded Units:			
o Psychiatric	722	733	906
o Rehabilitation	308	386	473
o Alcohol/Drug	216	326	352
Other Hospitals Not Paid Under PPS:			
o Cancer Treatment and Research Centers	4	6	8
o Christian Science Sanitoria	22	23	21
Hospitals Receiving Special Consideration:			
o Sole Community Hospitals	304	359	363
o Regional Referral Centers	6	158	171
o Hospitals that previously allowed extensive Part B billing	6	4	4

<sup>a</sup>Including separate cost entities.

<sup>b</sup>Hospitals involved in the Rochester and Finger Lakes Area Demonstration Projects.

Source: Health Care Financing Administration, Bureau of Program Operations, Bureau of Data Management and Strategy and Health Standards and Quality Bureau.



during FY 1986 (these States had previously been waived from participation in PPS), although this was partially offset by an increase in the number of categorically excluded hospitals (i.e., hospitals that are certified as being in one of five categories that are excluded from participation in PPS).

At the onset of prospective payment, hospitals in four States (Maryland, Massachusetts, New Jersey, and New York) were waived from participation in PPS, due to the existence of authorized payment system demonstration projects in these States. As mentioned above, hospitals in Massachusetts and New York (except for those hospitals involved in the Rochester and Finger Lakes area demonstration projects, whose waiver status was continued) became subject to the national system during FY 1986 (on October 1, 1985 in Massachusetts and January 1, 1986 in New York). As of the end of FY 1986, short-stay hospitals with waivers from the national system comprised about 2.5 percent of all Medicare hospitals.

Hospitals in outlying areas (Puerto Rico, the Virgin Islands, Guam, and American Samoa) were not covered by prospective payment as of the end of FY 1986, although Puerto Rico is scheduled to be included in the national system beginning in FY 1988. These areas contain less than one percent of all Medicare short-stay hospitals.

Hospitals that are certified by HCFA as psychiatric, rehabilitation, alcohol/drug, long-term, or children's hospitals were excluded from prospective payment during FY 1986.<sup>1</sup> As stated above, there was an increase during FY 1986 in the number of hospitals thus certified, from 10.6 percent to 11.4 percent of all Medicare hospitals. This increase is the logical result of hospitals' continually increasing familiarity with the implications of PPS, and the relative outcomes of inclusion or exclusion from

---

<sup>1</sup>Alcohol/drug hospitals and units were included under PPS in FY 1988.

the national system. Also, the procedure for filing for such exclusion has been continually refined. It should be pointed out, however, that these hospitals accounted for only 1.3 percent of all Medicare hospital discharges in FY 1986 (up from 1 percent in FY 1984).

#### Fiscal Intermediaries

The Social Security Amendments of 1965 (Public Law 89-97), which created the Medicare program, mandated that the new program should be administered through contracts with private sector organizations, rather than by the Federal Government itself. The organizations that administer the Medicare Hospital Insurance (HI, or Part A) program are called FIs and those that administer the Supplemental Medical Insurance (SMI, or Part B) program are called Carriers.

HCFA currently contracts with more than 60 FIs, with cash outlays to FIs during FY 1986 totalling over \$322 million. FIs do not cover specific jurisdictions such as States or regions and, in some cases, providers may select their FIs.

FIs are responsible for processing claims under Part A and for settlement of hospital cost reports. They are also responsible for verifying whether each patient is eligible for Medicare coverage and determining whether the services provided are covered. FIs also share responsibility for medical review with the PROs (see below), with the PROs performing this function for hospital inpatient services while the FIs review all other services provided under Part A. Under PPS, the scope of the FIs' medical review activities has been substantially reduced.

Although all FIs perform basically the same functions nationwide, there may be differences in specific practices, interpretations of rules, and rigor of medical review across FIs. This may affect the outcome of specific program changes such as PPS, despite the fact that they may be implemented on a nationwide basis.

Table 8.2 displays data on the volume of claims processed and the average percentage denied by FIs during 1984 and 1985 by type of provider, aggregated by State and region. As this table shows, there are wide variations in FI denial rates across regions, and across States within regions. Denial rates for inpatient hospital claims range from 0.81 percent in the East North Central region to 4.62 percent in the West South Central region, and from 0.01 percent in Missouri to 10.55 percent in New Mexico. Denial rates for skilled nursing facility (SNF) claims range from 8.17 percent in the West South Central region to 52.01 percent in the Mid-Atlantic region, and from 0.20 percent in Missouri to 78 percent in Maryland (the 100 percent figure for Connecticut is believed to be due to FI reporting errors). Overall denial rates are much more consistent across regions, ranging from 1.67 percent in the West North Central region to 5.83 percent in the Mid-Atlantic region, although there is still wide variation across States.

An issue in interpreting claims denial rates is that more than one service may be included in a single claim; if at least one of the services included in the claim is denied, it is counted as a denied claim. Thus, denial rates may be overstated in the data presented in Table 8.2. For home health services, HCFA's Bureau of Program Operations has begun reporting home health agency (HHA) visits denied as a percentage of total HHA visits processed, as a more accurate indicator of denial rates.

TABLE 8.2

T.C.A. CLAIMS PROCESS AND PERCENT DENIED BY FI, BY TYPE OF PROVIDER (average of 1984 &amp; 1985 rates)

	Total		Inpatient		Outpatient		SNF		HMO		Other	
	Claims Processed	% Denied	Claims	% Denied	Claims	% Denied	Claims	% Denied	Claims	% Denied	Claims	% Denied
<b>New England</b>												
CT	99190	2.89%	19628	3.82%	665625	1.53%	4088	100.00%	98562	2.80%	2708	1.71%
MA	4843.0	.50	68918	1.38	398829	.29	1238	2.91	25968	1.12	3158	4.48
MD	1861210	5.25	276867	4.08	1348291	5.76	8159	26.99	186688	2.84	48895	4.12
RI	419863	1.22	66481	3.06	297212	.46	2579	48.62	47819	1.81	5774	.18
VT	279265	1.33	58741	1.33	185618	.18	4842	55.18	31818	.64	6250	.88
Regional	4835745*	3.41**	658466*	3.40**	2886975*	3.12**	20826*	48.94**	391979*	2.34**	98485*	2.87**
<b>Mid-Atlantic</b>												
DE	1622869	2.99	348131	.91	985355	3.54	17231	66.47	284419	.68	67334	.14
MD	5987252	8.49	1057735	4.66	3686345	9.82	183654	59.67	373138	1.87	766166	7.52
PA	4642952	3.36	728328	2.39	2956438	2.62	94318	48.72	635364	1.62	235461	5.64
Regional	12251371	5.83	2186194	3.28	7548138	5.86	215395	52.81	1293873	1.24	1066581	6.93
<b>South Atlantic</b>												
DC	161658	4.21	26765	.68	182464	5.64	1871	36.56	22572	.61	7967	.41
FL	314363	6.68	55288	.54	296465	8.63	1235	38.12	33828	2.65	13535	18.86
GA	2583192	7.96	716478	6.66	1326388	9.24	86961	27.64	314826	.69	138828	6.61
NC	1885825	2.76	265665	2.88	785127	2.79	3888	38.88	57491	3.83	49736	4.88
SC	818724	5.68	162884	4.68	565824	5.78	2812	78.13	63688	5.62	16482	2.49
VA	1144629	3.68	272453	3.88	686793	3.59	12783	51.85	184831	.78	68652	3.13
WV	619715	3.52	129735	.86	367824	4.11	18151	18.71	75749	2.79	36257	6.63
Regional	888427	1.69	288253	.92	554539	2.81	6897	11.68	34518	.38	76162	1.18
Regional	537156	1.76	125369	1.39	344248	1.63	5867	31.72	37434	.25	24967	1.27
Regional	8137689	4.88	1978834	3.76	4859685	5.24	131585	29.24	744191	1.56	432365	4.36
<b>East North Central</b>												
IL	2688944	1.77	686654	1.06	1627888	1.83	82795	12.88	2539.9	5.35	117555	.82
IN	1154836	5.61	268711	1.36	783733	7.85	16836	15.26	72167	1.87	28592	18.22
MI	2421218	3.98	398218	.15	1668889	4.29	42663	38.91	235368	.96	83553	3.84
OH	2281159	2.29	514457	.98	1488748	2.42	43335	13.29	174438	2.52	68191	2.54
WI	1126764	5.23	231979	.46	723184	6.81	8617	16.86	91781	7.45	21263	6.72
Regional	9672113	3.29	2884229	.81	6292274	3.55	194246	18.78	828153	3.44	353176	3.95
<b>East South Central</b>												
AL	757725	3.69	236288	1.75	418649	5.35	6725	.74	78624	.78	17328	4.34
GA	778413	3.58	283137	5.82	454882	2.24	11598	45.17	67819	.35	48977	3.35
MS	648798	1.89	178184	.14	386681	1.43	897	1.23	12804	1.83	35832	8.88
TX	1873596	1.79	383733	.68	513866	2.61	13345	.79	168478	1.24	82955	2.88
Regional	3258532	2.58	913262	1.82	1693298	2.97	32565	16.59	435135	1.19	176274	2.15

\* Total Claims Processed in Region

\*\* Weighted Average of % Claims Denied in Region

8.2  
TABLE 1 CONTINUED

TOTAL CLAIMS PROCESS AND PERCENT DENIED BY FI, BY TYPE OF PROVIDER (average of 1964 & 1965 rates)

	Total		Inpatient		Outpatient		SNF		HMO		Other	
	Claims Processed	% Denied	Claims	% Denied	Claims	% Denied	Claims	% Denied	Claims	% Denied	Claims	% Denied
<b>West North Central</b>												
IL	89949	.92	197305	.92	567128	.72	7962	4.91	115388	1.65	11675	.68
IN	492984	.88	115383	1.11	3288.6	.53	2869	5.48	48667	1.83	6851	.56
KS	764716	2.63	188819	2.87	478311	1.99	7981	72.01	34298	3.84	63315	.86
MI	1374344	.13	353514	.01	735315	.88	18914	.28	288523	.51	57676	.23
MO	1279181	3.28	488758	1.25	645745	1.25	77488	32.85	39854	1.36	186153	2.22
NE	132865	5.52	47635	3.39	73263	6.28	2368	36.55	7799	2.38	969	2.93
ND												
Regional:	4942668*	1.67**	1383326*	1.84**	2827778*	1.81**	117586*	27.23**	446113*	1.22**	247861*	1.18**
<b>West South Central</b>												
AR	455938	3.37	159663	1.88	258479	4.83	1445	6.83	27919	3.63	16225	1.51
LA	713886	5.46	288427	2.96	488727	7.88	4339	18.37	78229	3.25	37386	5.88
OK	483679	4.84	148953	.88	197285	8.81	1546	.84	42897	4.22	13875	5.43
TX	1634646	5.86	568211	7.21	936111	5.98	5835	8.47	218858	.98	111132	7.65
Regional:	3487341	5.32	1877454	4.62	1785822	6.26	13165	8.17	353983	2.83	177882	6.51
<b>Mountain</b>												
AZ	416538	1.35	123366	.45	278476	1.84	2468	24.84	5488	.26	6741	2.16
CO	351852	4.78	111536	.82	365832	6.12	5484	4.53	49458	2.28	28422	6.42
ID	198715	3.24	38567	1.28	119768	2.46	4775	49.78	19625	.22	7794	3.98
MT	169892	2.26	38658	1.73	188146	2.83	2932	35.86	13629	.85	14536	.96
NE	162856	2.66	39648	2.24	86439	2.42	6281	9.31	23262	3.14	7229	.46
NV	326492	7.57	59736	18.55	235485	7.45	1889	17.85	22352	2.81	8362	.71
UT	286184	3.22	48248	.63	128843	3.14	4857	.67	28472	9.84	12485	2.43
WY	61964	1.76	14792	.42	39158	2.47	157	1.91	6865	.33	974	5.24
Regional:	2886487	3.88	466543	2.17	1353339	4.22	27883	18.63	161363	2.84	78535	3.88
<b>Pacific</b>												
CA	4152583	2.41	949596	2.58	2535114	1.73	76583	25.84	343654	2.43	246435	1.51
OR	128623	3.51	25729	7.73	82541	1.68	2444	46.68	6876	.57	11653	.23
WA	527156	3.81	128538	.99	317823	3.71	6955	21.28	51779	.18	38278	4.53
DP	729496	2.26	185857	1.66	416761	2.19	15586	23.88	64481	.63	47751	.31
Regional:	5537858	2.47	1288914	2.34	3352259	1.97	101486	25.18	466918	1.98	336285	1.88

\* Total Claims Processed in Region

\*\* Weighted Average of % Claims Denied in Region

Source: FI Denial Rates  
Health Care Financing Administration: BPO

## Peer Review Organizations

The Social Security Amendments of 1972 (Public Law 92-603) mandated the formation of Professional Standards Review Organizations (PSROs), to ensure the provision of high-quality care to Medicare beneficiaries and to reduce the unnecessary utilization of services. As cost containment pressures intensified in the early 1980s, the need for improved utilization and quality control was recognized. Under the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA, Public Law 97-248), the PSROs were replaced by the current PRO program, designed to monitor the completeness, adequacy, and quality of inpatient hospital services and the appropriateness of hospital admissions and discharges. Under PFS, the PROs also review the validity of the diagnostic information provided by the hospital and the appropriateness of care provided to (exceptionally long-stay or high cost) cases for which additional outlier payments are sought.

While the PSROs operated under a grant mechanism, the PRO for each State is under contract with HCFA. PROs also have the authority to deny payment and to implement sanctions to providers when appropriate, while the PSROs could only recommend such action to the Secretary of Health and Human Services. Moreover, the PROs are evaluated by an outside entity, known as the SuperPRO, while there was no such arrangement for systematic review of the PSROs.

During the fourth quarter of FY 1984 and the first quarter of FY 1985, all 141 existing PSROs were phased out, and 54 PRO contracts were awarded--one each for the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam/American Samoa. In 1986, cash outlays from the Medicare Trust Funds for the PRO program totalled more than \$151 million.

During the first round of competitive bidding for PRO contracts, each PRO proposed objectives in each of eight utilization and quality control categories that were to be met during the contract period. The PROs in each State could thus target problems specific to that State, reflecting the local practice of medical care. During the second contract period, however, the PROs were permitted much less flexibility in the objectives that they proposed, in an effort to increase the consistency of medical review across the country.

Table 8.3 displays denial rates for each of the 46 PROs in the original PPS States in each of the following review categories:

- o Review of a sample of all admissions;
- o Preadmission review of certain surgical procedures;
- o Transfers from PPS hospitals to hospitals/units that are exempt from PPS;
- o Transfers from PPS hospitals to other PPS hospitals; and
- o Readmissions.

These rates are for the period from the PRO's start-up through September 1986.

As is the case with the FIs, there is a considerable amount of variation in PRO denial rates from State to State. For the sample of admissions, for example, denial rates vary from 0.02 percent in Kentucky to 9.78 percent in West Virginia. It is difficult to tell, however, whether this variation in denial rates reflects differences in the stringency of medical review or in the compatibility of the PRO criteria with local practice patterns.

The SuperPRO evaluates the success of the PROs by sampling records that have been reviewed by the PROs and making an independent determination of the

TABLE 8.5

PRO DENIAL RATES, BY DENIAL CATEGORIES  
(PRJ start-up through September, 1986)

	<u>Admission Sample</u>	<u>Preadmission Review</u>	<u>Transfers to Exempt Hospitals and Units</u>	<u>Transfers to Other Acute, POS Hospitals</u>	<u>Readmissions</u>
<u>PROs</u>					
CA	3.88%	.25%	12.42%	3.14%	3.58%
ME	4.15	4.74	19.96	2.49	5.76
NH	.86	.17	0.00	1.13	1.47
RI	7.94	3.56	1.89	1.48	3.61
VT	.68	.67	0.00	.35	.85
MA	Waivered				
PA1	2.12	.82	1.71	1.82	3.05
PA2	5.62	5.31	.28	.86	1.26
NJ	Waivered				
NY	Waivered				
DC	1.75	3.27	7.69	1.08	2.86
DEL	.74	3.84	.18	.68	1.66
VA	1.76	.48	3.49	2.99	3.91
WV	9.76	.28	1.42	.96	7.62
FL	2.96	1.88	3.91	1.83	4.53
GA	4.73	1.34	7.28	2.63	2.81
NC	6.07	.84	2.28	.29	.88
SC	.89	.86	.62		1.17
MD	Waivered				
IL	3.36	3.88	2.11	1.48	4.82
IN	2.78	3.34	1.93	1.37	1.67
MIC	7.84	2.73	7.88	5.68	5.95
OH	2.21	2.57	3.54	1.48	3.82
WI	2.58	1.81	3.17	1.89	2.84
ALB	.39	.83	.92	.86	3.89
KY	.82	.38	0.00	.33	2.34
MS	2.49	.24	1.51	.74	2.88
TN	1.24	1.39	.33	.38	.53
WA	2.62	.25	6.71	.83	4.48
IDWA	.86	2.26	3.18	1.64	5.98
KS	3.89	.15	.91	1.74	2.42
MO	3.64	2.81	8.21	2.99	3.12
NE	4.89	.45	4.31	1.28	4.49
ND	6.46	.68	7.59	.89	4.81
SD	1.29	8.88	6.94	1.43	3.58



2.3  
Table 4 Continued

PRO DENIAL RATES, BY DENIAL CATEGORIES

	<u>Admission Sample</u>	<u>Preadmission Review</u>	<u>Transfers to Exempt Hospitals and Units</u>	<u>Transfers to Other Acute, POS Hospitals</u>	<u>Rejections</u>
<u>PROs</u>					
ARK	6.19	.27	18.24	4.87	6.63
LA	3.21	1.16	2.96	2.39	4.59
OK	1.77	.55	6.83	.85	2.46
TX	5.75	.81	3.71	3.31	6.86
ID	2.28	4.17	11.63	1.68	2.57
MT	.93	.54	.69	1.75	1.51
CO	2.85	.18	4.25	.92	5.63
WY	1.18	.84	4.14	.67	.89
UT	.48	4.82	1.98	2.94	1.31
WY	.68	8.88	17.54	2.94	.97
AZ	2.57	2.39	5.12	1.22	1.74
NV	6.39	1.24	18.26	5.88	11.78
AK	4.88	10.11	1.85	1.69	5.62
OR	2.25	.93	32.81	1.16	2.58
WA	1.64	1.68	2.72	1.81	4.13
CA	1.53	2.22	4.73	1.83	2.35
HA	2.88	8.49	4.95	4.84	3.85

Source: PRO Denial Rates  
Health Care Financing Administration, HS05

necessity and appropriateness of care. The PROs are then rated by their success in having detected problems in coding, appropriateness, or necessity that are identified by the SuperPRO. There is wide variation both in the frequency of problems identified by the SuperPRO and in the success of the PROs in detecting these problems.

High denial rates seem to be correlated with high SuperPRO scores, but do not insure them. In Table 8.4, the PROs are grouped according to both their overall denial rates and their overall SuperPRO detection rates, into high, moderate, and low thirds. As this table shows, eight of the fourteen PROs with the highest denial rates are also in the highest detection rate group. Six of the thirteen most lenient PROs had among the lowest detection rates. In all, 19 of the 42 PROs listed were in the same third according to each measure, while only 10 were in opposite thirds.

#### Medicare Benefit Payments

##### Inpatient Hospital Benefit Payments

Table 8.5 displays the growth of estimated incurred Medicare benefit payments over time, from the beginning of the Medicare program in FY 1967 through the third year of prospective payment in FY 1986. As shown in this table, inpatient hospital payments rose from \$2.7 billion in FY 1967 to over \$37 billion in FY 1983, the last pre-PPS year. During this time, the annual increase in this largest component of Medicare spending was less than 10 percent only once in 16 years (in FY 1973, when the Nixon Administration's Economic Stabilization Program included mandatory limits on increases in wages and prices in many industries), and the average compounded rate of increase was 17.4 percent.

TABLE 8.4

FI Inpatient Denials and Pro Denial Stringency  
 (FI Denials Based on average of 1984 and 1985 rates,  
 PRO Denial Stringency based on average of cycle 1 and cycle 2)

Percent of Inpatient Claims Denied by FI

	<u>HIGH</u>	<u>MODERATE</u>	<u>LOW</u>
PRO (INPATIENT) DENIAL STRINGENCY	HIGH	Connecticut Hawaii Louisiana Nevada North Dakota Texas	Arkansas Georgia Idaho Illinois Maine Nebraska West Virginia
			Michigan Missouri
	MODERATE	Florida North Carolina	Minnesota Oregon Rhode Island Virginia Washington
			Arizona Wash. D.C. Iowa Ohio Oklahoma Utah Wisconsin Wyoming
	LOW	California Kentucky New Hampshire New Mexico Pennsylvania	Alabama Indiana Kansas Montana
			Colorado Delaware Mississippi South Carolina Tennessee

Missing States: Maryland, New York, New Jersey and Massachusetts were waived, and Alaska, South Dakota and Vermont were handled by FIs in other states.

Source: FI Denials: Health Care Financing Administration; BPO  
 PRO Denials: Health Care Financing Administration; HSQB

Table 8.5

ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS BY TYPE OF PROVIDER  
FY 1987-88  
(In \$ millions)

Fiscal Year	Inpatient Hospital		Outpatient Hospital <sup>a</sup>		Physician <sup>b</sup>		Skilled Nursing		Home Health <sup>c</sup>	
	Amount	Pct. Change	Amount	Pct. Change	Amount	Pct. Change	Amount	Pct. Change	Amount	Pct. Change
1967	2,729	---	25	---	1,049	---	147	---	34	---
1968	3,464	+ 26.9	43	+ 72.0	1,343	+ 28.0	361	+145.6	69	+102.9
1969	4,200	+ 21.2	81	+ 88.4	1,610	+ 19.9	416	+ 15.2	95	+ 37.7
1970	4,663	+ 11.0	114	+ 40.7	1,739	+ 8.0	294	- 29.3	99	+ 4.2
1971	5,355	+ 14.8	148	+ 29.8	1,869	+ 7.5	216	- 26.5	85	- 14.1
1972	5,937	+ 10.9	171	+ 15.5	2,037	+ 9.0	180	- 16.7	91	+ 7.1
1973	6,513	+ 9.7	192	+ 12.3	2,206	+ 8.3	203	+ 12.8	116	+ 27.5
1974	7,945	+ 22.0	381	+ 98.4	2,641	+ 19.7	255	+ 25.6	152	+ 31.0
1975	9,943	+ 25.1	538	+ 41.2	3,194	+ 20.9	280	+ 9.8	246	+ 61.8
1976	11,808	+ 18.8	751	+ 39.6	3,802	+ 19.0	318	+ 13.6	356	+ 44.7
TQ*	3,153	---	256	---	1,127	---	87	---	107	---
1977	14,508	---	1,076	---	4,724	---	352	---	476	---
1978	16,813	+ 15.9	1,299	+ 20.7	5,594	+ 18.4	352	0.0	555	+ 16.6
1979	19,299	+ 14.8	1,576	+ 21.3	6,618	+ 18.3	366	+ 4.0	649	+ 16.9
1980	23,290	+ 20.7	1,889	+ 19.9	8,048	+ 21.6	401	+ 9.6	782	+ 20.5
1981	27,891	+ 19.8	2,261	+ 19.7	9,689	+ 20.4	439	+ 9.5	976	+ 24.8
1982	32,786	+ 17.6	2,627	+ 16.2	11,567	+ 19.4	472	+ 7.5	1,293	+ 32.5
1983	37,198	+ 13.5	3,090	+ 17.6	13,790	+ 19.2	513	+ 8.7	1,683	+ 30.2
1984	40,555	+ 9.0	3,576	+ 15.7	15,353	+ 11.3	533	+ 3.9	2,011	+ 19.5
1985	43,628	+ 7.6	4,143	+ 15.9	16,617	+ 8.2	593	+ 11.3	2,338	+ 16.3
1986	45,645	+ 4.6	5,287	+ 27.6	19,252	+ 15.9	621	+ 4.7	2,664	+ 13.9

<sup>a</sup>Includes payments for routine maintenance dialysis treatments since FY 1974.

<sup>b</sup>Includes payments for inpatient radiology and pathology services, as well as durable medical equipment, ambulance, and several other non-physician services covered under Medicare Supplementary Medical Insurance.

<sup>c</sup>Includes payments under both Medicare Hospital Insurance and Supplementary Medical Insurance.

\*Transitional quarter to adjust for change in start of Federal fiscal year from July 1 to October 1 in 1976.

Note: Payments on an incurred basis by type of provider are estimated and subject to change as more recent and complete data become available and estimates are revised.

Source: Health Care Financing Administration, Office of the Actuary.

In FY 1984--the first year of PPS--inpatient hospital payments increased by only 9 percent. This was the smallest percentage increase in inpatient hospital payments in the history of the Medicare program up to that time. In FY 1985, inpatient hospital payments increased by only 7.6 percent, again the smallest increase in the program's history. This trend toward diminishing rates of growth continued in FY 1986. The estimated 4.6 percent increase in inpatient hospital payments in the third year of PPS was less than half as great in percentage terms as the smallest increase prior to prospective payment.

As Table 8.6 shows, the percentage of total Medicare benefit payments accounted for by inpatient hospital services had dropped before PPS from a peak of 70.1 percent in FY 1972 and FY 1973 to 65.4 percent in FY 1983. After 3 years of prospective payment, the share of inpatient hospital payments was at an all-time low of 61.0 percent.

Table 8.7 describes the real rate of growth (i.e., the rate of growth net of the general inflation throughout the economy) of inpatient hospital payments over the history of the Medicare program. This table shows that, while much of the increase in inpatient hospital payments that occurred during the period from the mid-1970s through the early 1980s could be attributed to general inflation (since the Consumer Price Index rose by 123 percent from FY 1973 to FY 1982), there was substantial growth net of general inflation. From FY 1967 to FY 1983, real inpatient hospital payments increased by 354 percent. This rapid growth has clearly decreased under PPS. During the first year of prospective payment, the real growth in inpatient hospital payments was only half what it had been immediately prior to PPS, and the real increases in the 2 succeeding years have been the two smallest in the history of the program.

Table 8.6

DISTRIBUTION OF ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS  
BY TYPE OF PROVIDER  
FY 1967-86

<u>Fiscal</u> <u>Year</u>	<u>Inpatient</u> <u>Hospital</u>	<u>Outpatient</u> <u>Hospital</u>	<u>Physician</u>	<u>Skilled</u> <u>Nursing</u>	<u>Home</u> <u>Health</u>	<u>Other</u>
1967	68.1%	0.6%	26.2%	3.7%	0.8%	0.5%
1968	65.2	0.8	25.3	6.8	1.3	0.6
1969	65.2	1.3	25.0	6.5	1.5	0.6
1970	67.1	1.6	25.0	4.2	1.4	0.5
1971	69.4	1.9	24.2	2.8	1.1	0.5
1972	70.1	2.0	24.1	2.1	1.1	0.6
1973	70.1	2.1	23.8	2.2	1.2	0.6
1974	69.4	3.3	23.1	2.2	1.3	0.7
1975	69.5	3.8	22.3	2.0	1.7	0.8
1976	68.7	4.4	22.1	1.9	2.1	0.8
TQ*	66.1	5.4	23.6	1.8	2.2	0.9
1977	68.1	5.0	22.2	1.7	2.2	0.8
1978	67.8	5.2	22.6	1.4	2.2	0.8
1979	67.1	5.5	23.0	1.3	2.3	0.8
1980	67.0	5.4	23.2	1.2	2.3	0.9
1981	66.9	5.4	23.2	1.1	2.3	1.0
1982	66.5	5.3	23.5	1.0	2.6	1.1
1983	65.4	5.4	24.2	0.9	3.0	1.1
1984	64.5	5.7	24.4	0.8	3.2	1.3
1985	63.8	6.1	24.3	0.9	3.4	1.6
1986	61.0	7.1	25.7	0.8	3.6	1.8

\*Transitional quarter to adjust for change in start of Federal fiscal year from July 1 to October 1 in 1976.

Source: Health Care Financing Administration, Office of the Actuary.

Table 8.7

ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS  
FOR INPATIENT HOSPITAL SERVICES  
FY 1967-86

<u>Fiscal Year</u>	<u>Incurred Payments (in \$ millions)</u>	<u>Percent Change</u>	<u>Real Payments<sup>a</sup> (in \$ millions)</u>	<u>Percent Change</u>
1967	2,729	---	2,768	---
1968	3,464	+ 26.9	3,399	+ 22.8
1969	4,200	+ 21.2	3,933	+ 15.7
1970	4,663	+ 11.0	4,123	+ 4.8
1971	5,355	+ 14.8	4,500	+ 9.1
1972	5,937	+ 10.9	4,815	+ 7.0
1973	6,513	+ 9.7	5,080	+ 5.5
1974	7,945	+ 22.0	5,687	+ 11.9
1975	9,943	+ 25.1	6,407	+ 12.6
1976	11,808	+ 18.8	7,105	+ 10.9
TQ*	3,153	---	1,834	---
1977	14,508	---	8,119	---
1978	16,813	+ 15.9	8,789	+ 8.3
1979	19,299	+ 14.8	9,146	+ 4.1
1980	23,290	+ 20.7	9,716	+ 6.2
1981	27,891	+ 19.8	10,477	+ 7.8
1982	32,786	+ 17.6	11,464	+ 9.4
1983	37,198	+ 13.5	12,567	+ 9.6
1984	40,555	+ 9.0	13,163	+ 4.7
1985	42,628	+ 7.6	13,659	+ 3.8
1986	45,645	+ 4.6	13,946	+ 2.1

<sup>a</sup>In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

\*Transitional quarter to adjust for change in start of Federal fiscal year from July 1 to October 1 in 1976.

Source: Health Care Financing Administration, Office of the Actuary.

The effect of PPS is more explicitly represented in Table 8.8. This table compares average annual increases in incurred Medicare benefit payments, in both nominal and real terms, for the 5 years immediately preceding the cost containment provisions of TEFRA (FY 1977-82), the year that TEFRA's provisions were in effect (FY 1983), and the years since the implementation of prospective payment (FY 1984-86). As this table shows, the nominal rate of growth in inpatient hospital payments appears to have decreased steadily from the pre-TEFRA period to the TEFRA year and from the TEFRA year to the PPS period (17.7, 13.5, and 3.5 percent annually, respectively). As stated above, much of the nominal growth in inpatient hospital payments during the pre-TEFRA period was due to general inflation. Nonetheless, the real rate of growth under PPS is less than half of the pre-TEFRA rate (3.5 percent versus 7.1 percent).

#### Outpatient Hospital Benefit Payments

With the implementation of PPS, it was feared that, since the new system would encourage hospitals to shift treatment from the inpatient setting, utilization of--and thus payments for--outpatient hospital services would increase. If this increase was large enough, it was argued, it might counteract much of the cost saving effect of prospective payment.

Table 8.5 shows that outpatient hospital payments grew from \$25 million in FY 1967 to about \$3.1 billion in FY 1983--more than a hundredfold increase. The compounded annual rate of increase over these years was 34.5 percent. In fact, outpatient hospital payments have had double-digit increases in every year since the beginning of the Medicare program. Much of this increase is due to expansions in coverage for outpatient services as the



Table 8.8

AVERAGE ANNUAL RATES OF INCREASE  
IN ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS  
BY TYPE OF PROVIDER

<u>Type of Provider</u>	<u>FY 1977-82</u>		<u>FY 1982-83</u>		<u>FY 1983-86</u>	
	<u>Nominal</u>	<u>Real<sup>a</sup></u>	<u>Nominal</u>	<u>Real<sup>a</sup></u>	<u>Nominal</u>	<u>Real<sup>a</sup></u>
Inpatient Hospital	+17.7%	+ 7.1%	+13.5%	+ 9.6%	+ 7.1%	+ 3.5%
Outpatient Hospital	+19.5	+ 8.8	+17.6	+13.7	+19.6	+15.7
Physician	+19.6	+ 8.9	+19.2	+15.2	+11.8	+ 8.1
Skilled Nursing	+ 6.0	- 3.5	+ 8.7	+ 5.0	+ 6.6	+ 3.2
Home Health	+22.1	+11.2	+30.2	+25.8	+16.5	+12.7

<sup>a</sup>In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

Source: Health Care Financing Administration, Office of the Actuary.

Medicare program developed, such as the inclusion of routine maintenance dialysis treatments in FY 1974.

During FY 1984 and FY 1985, the first 2 years of PPS, outpatient hospital payments increased by only 15.7 and 15.9 percent, respectively--the smallest percentage increases in more than a decade. During FY 1986, however, there was a 27.6 percent increase--the largest in 10 years.

The steady increase in outpatient hospital payments is reflected in Table 8.6 by the growing share of these payments relative to total Medicare benefit payments. In FY 1967, outpatient hospital payments accounted for less than two-thirds of 1 percent of total Medicare benefit payments; by FY 1983, this share had increased to 5.4 percent. Under PPS, with inpatient hospital benefits growing at a decreasing rate, the share of outpatient hospital payments has continued to increase, to 7.1 percent in FY 1986--well over 10 times what it had been at the outset of the Medicare program.

As shown in Table 8.8, the nominal rates of increase in outpatient hospital payments for the pre-TEFRA, TEFRA, and PPS periods are roughly comparable (19.5, 17.6, and 19.6 percent, respectively). However, in real terms, outpatient hospital payments are increasing at an accelerating rate (15.7 percent under PPS versus 8.8 percent pre-TEFRA). This indicates that services provided under Medicare (or, at least, payments for those services) are, in fact, being shifted to the outpatient setting at an increasing rate.

#### Physician Benefit Payments

Physician services are second only to inpatient hospital services in volume of Medicare benefit payments. With the increasing emphasis on the provision of health care outside of the hospital (as described throughout the

previous chapters of this report), the volume of physician payments would be expected to increase, at least relative to inpatient hospital payments.

As shown in Table 8.5, physician payments increased from \$1.0 billion in FY 1967 to \$13.8 billion in FY 1983--a thirteenfold increase. The compounded annual rate of increase during the pre-PPS period was 17.2 percent. In FY 1984, physician payments increased by 11.3 percent--the smallest percentage increase in 11 years--and in FY 1985, the increase was only 8.2 percent--the fifth consecutive year in which the percentage growth in physician payments had declined. However, there was a sharp increase in physician payments in FY 1986 (15.9 percent), possibly due to the partial lifting of the Medicare physician fee freeze.

Table 8.6 shows that, despite the fee freeze, the share of physician payments relative to total Medicare payments has continued on an upward trend under PPS, rising to 25.7 percent in FY 1986 from 22.1 percent 10 years earlier. This follows the declining trend that took place during Medicare's early years, as the share of physician payments fell from a high of 26.2 percent in FY 1967. These trends reflect the expansion of the types of services covered by Medicare, as well as the relative utilization and costliness of physician care.

Table 8.8 shows that, although there has been a steady decline in the nominal rate of growth of physician payments from the pre-TEFRA period to the TEFRA year to the PPS period (19.6, 19.2, and 11.8 percent compounded annual rates of increase, respectively), the real rate of growth under PPS (8.1 percent) is comparable to that in the pre-TEFRA period (8.9 percent).

### Skilled Nursing Benefit Payments

With the decrease in average length of stay for Medicare patients (as described in Chapter 3), an increase in utilization of and expenditure for post-discharge sub-acute care might be expected (see Chapter 5). Medicare's coverage of this type of care is provided under the skilled nursing and home health benefits.

Table 8.5 shows that skilled nursing payments have followed the most irregular pattern of any component of Medicare benefit payments. The annual change in skilled nursing payments has varied from a 145.6 percent increase in FY 1968 (due to the correction of an early tendency to view this benefit as a long-term care benefit, rather than as an extension of inpatient hospital care) to a 29.3 percent decrease only 2 years later. From the beginning of the Medicare program to FY 1983, skilled nursing payments increased from \$147 million to \$513 million--an increase of almost 250 percent. The compounded annual rate of increase during that pre-PPS period was 8 percent.

Under PPS, the pattern of skilled nursing payments has continued to be erratic. In FY 1984, skilled nursing payments increased by 3.9 percent--the smallest percentage increase in 5 years, despite the expectation of increased demand for these services. In FY 1985, however, the increase was 11.3 percent--the largest increase in 9 years. In FY 1986, the increase was 4.7 percent.

As Table 8.6 shows, skilled nursing payments accounts for a smaller share of total Medicare benefit payments than any other major component. In fact, the share of skilled nursing payments has been continuously falling since FY 1968, from 6.8 percent to the current 0.8 percent.

Table 8.8 also reflects the erratic pattern of growth in skilled nursing payments. In the immediate pre-TEFRA period, the nominal rate of increase in skilled nursing payments was 6.0 percent--about one-third of the growth rate of the other major components of Medicare benefit payments. In real terms, this represented a 3.5 percent annual decrease. During the PPS period, skilled nursing payments have increased at a nominal rate of 6.6 percent (a real rate of 3.2 percent)--slower even than the growth of inpatient hospital payments.

#### Home Health Benefit Payments

As Table 8.5 shows, home health payments increased from \$34 million in FY 1967 to almost \$1.7 billion in FY 1983--an almost fifty-fold increase. The compounded annual rate of increase during that pre-PPS period was 27.1 percent. In fact, from FY 1973 to FY 1983, the increase in home health payments was less than 20 percent in only 2 of those 11 years. Under PPS, home health payments have continued to grow rapidly, but at a decreasing rate. In FY 1986, the rate of increase in home health payments declined for the fourth consecutive year.

Despite this recent decline in the rate of growth, the share of home health payments has continued to increase, from 0.8 percent in FY 1967 to 3.6 percent in FY 1986. This share has increased in every year since FY 1972. This trend can be contrasted with the decreasing share of skilled nursing payments, described above. In FY 1968, skilled nursing payments accounted for 6.8 percent of total Medicare benefit payments, while home health payments accounted for only 0.8 percent. By FY 1976, the share of home health payments exceeded that of skilled nursing payments, and by FY 1986,

home health payments accounted for a 3.6 percent share of total Medicare benefit payments, compared to 0.8 percent for skilled nursing payments. It is interesting to note, however, that the combined share of these two categories was higher in FY 1986 (4.4 percent) than it had been for 16 years.

Table 8.8 shows that, although the nominal rate of growth of home health payments has decreased from the pre-TEFRA to the PPS period (from 22.1 percent to 16.5 percent annually), this decrease is due to general inflation. In real terms, home health payments are increasing at a slightly higher rate under PPS than they were in the pre-TEFRA period.

#### Total Medicare Benefit Payments

Total Medicare benefit payments increased from \$4 billion in FY 1967 to \$56.9 billion in FY 1983, as shown in Table 8.9. During that time period, the annual increase was never less than 15 percent, except for FY 1970-73. The two major parts of the Medicare program--HI and SMI--increased at comparable rates during the pre-PPS period, with HI payments growing by 1,259 percent (17.4 percent annually) and SMI payments growing by 1,482 percent (18.5 percent annually). Between FY 1974 and FY 1983, neither HI nor SMI payments increased by less than 14 percent in any year. In FY 1984, however, total Medicare benefit payments increased by only 10.4 percent--the smallest increase in 11 years--and in FY 1985, the increase was only 8.8 percent--the second smallest increase in the history of the program. In FY 1986, the rate of increase rose slightly to 9.3 percent, but the growth in total Medicare benefit payments in the 3 PPS years still is the slowest for any 3 consecutive years since the program began.

Table 8.9

ESTIMATED INCURRED MEDICARE BENEFIT PAYMENTS  
UNDER HOSPITAL INSURANCE (HI) AND SUPPLEMENTARY MEDICAL INSURANCE (SMI)  
FY 1967-86  
(in \$ millions)

Fiscal Year	HI Payments		SMI Payments		Total Payments	
	Amount	Percent Change	Amount	Percent Change	Amount	Percent Change
1967	2,897	---	1,109	---	4,006	---
1968	3,868	+ 33.5	1,443	+ 30.1	5,311	+ 32.6
1969	4,675	+ 20.9	1,766	+ 22.4	6,441	+ 21.3
1970	5,018	+ 7.3	1,929	+ 9.2	6,947	+ 7.9
1971	5,623	+ 12.1	2,090	+ 8.3	7,713	+ 11.0
1972	6,176	+ 9.8	2,289	+ 9.5	8,465	+ 9.7
1973	6,787	+ 9.9	2,499	+ 9.2	9,286	+ 9.7
1974	8,304	+ 22.4	3,150	+ 26.1	11,454	+ 23.3
1975	10,381	+ 25.0	3,930	+ 24.8	14,311	+ 24.9
1976	12,357	+ 19.0	4,822	+ 22.7	17,179	+ 20.0
TQ*	3,307	---	1,466	---	4,773	---
1977	15,175	---	6,137	---	21,312	---
1978	17,549	+ 15.6	7,256	+ 18.2	24,805	+ 16.4
1979	20,132	+ 14.7	8,614	+ 18.7	28,746	+ 15.9
1980	24,268	+ 20.5	10,472	+ 21.6	34,740	+ 20.9
1981	29,140	+ 20.1	12,544	+ 19.8	41,684	+ 20.0
1982	34,536	+ 18.5	14,731	+ 17.4	49,267	+ 18.2
1983	39,372	+ 14.0	17,542	+ 19.1	56,914	+ 15.5
1984	43,074	+ 9.4	19,769	+ 12.7	62,843	+ 10.4
1985	46,545	+ 8.1	21,847	+ 10.5	68,392	+ 8.8
1986	48,933	+ 5.1	25,852	+ 18.3	74,785	+ 9.3

\*Transitional quarter to adjust for change in start of Federal fiscal year from July 1 to October 1 in 1976.

Source: Health Care Financing Administration, Office of the Actuary.

The declining growth in total Medicare benefit payments appears to be due to the successful control of HI payments under PPS. While SMI payments have continued to rise at a double-digit rate, HI payments have increased by only 9.4 percent, 8.1 percent, and 5.1 percent, respectively, in the three PPS years--the latter being by far the smallest increase in the history of the program.

Table 8.10 describes the trend, in both nominal and real terms, in total Medicare benefit payment payments. As shown in this table, total Medicare benefit payments have grown faster than the number of Medicare enrollees in every year throughout the history of the program, with payments per enrollee increasing from \$207 in FY 1967 to \$2,368 in FY 1986--an increase of 1,067 percent, or 13.6 percent annually. In real terms, there was a slight decrease (from \$325 to \$323) in payments per enrollee in FY 1973, but the overall trend has been upward, with real payments per enrollee increasing by 245 percent, or 6.6 percent annually. In other words, total Medicare benefit payments per enrollee have increased at an annual rate of 6.6 percent above the general rate of inflation.

Table 8.11 compares nominal and real rates of change in HI, SMI, and total Medicare benefit payments and payments per enrollee in the 5-year period immediately preceding TEFRA, the TEFRA year, and the first 3 years of PPS. The data in this table show that, while the real growth rate of HI payments under PPS is only slightly more than half of what it was in the pre-TEFRA period (4.0 percent versus 7.3 percent), SMI payments are growing faster in real terms under PPS than they did in the pre-TEFRA period (10.1 percent versus 8.4 percent). The result is that total Medicare benefit payments are growing at only a slightly slower real rate than they were prior to TEFRA (5.9 percent versus 7.6 percent).



Table 8.10

TOTAL INCURRED MEDICARE BENEFIT PAYMENTS PER ENROLLEE  
FY 1967-86

Fiscal Year	Total Benefit Payments (in \$ millions) <sup>b</sup>		Medicare Enrollees <sup>a</sup> (in thousands)	Payments per Enrollee	
	Nominal	Real		Nominal	Real <sup>b</sup>
1967	4,006	4,063	19,315	207	210
1968	5,311	5,212	19,671	270	265
1969	6,441	6,031	19,962	323	302
1970	6,947	6,142	20,297	342	303
1971	7,713	6,482	20,703	373	313
1972	8,465	6,865	21,124	401	325
1973	9,286	7,243	22,439	414	323
1974	11,454	8,199	23,873	480	343
1975	14,311	9,221	24,580	582	375
1976	17,179	10,336	25,311	679	408
1977	21,312	11,926	26,259	812	454
1978	24,805	12,967	26,988	919	480
1979	28,746	13,624	27,685	1,038	492
1980	34,740	14,493	28,323	1,227	512
1981	41,684	15,659	28,877	1,444	542
1982	49,267	17,226	29,373	1,677	586
1983	56,914	19,228	29,893	1,904	643
1984	62,843	20,397	30,348	2,071	672
1985	68,392	21,413	30,926	2,211	692
1986	74,785	22,849	31,580 <sup>c</sup>	2,368	724

<sup>a</sup> Estimated from enrollment figures for calendar years (as of July 1).

<sup>b</sup> In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

<sup>c</sup> Based on rate of growth in Medicare enrollment during FY 1986, as estimated by HCFA's Office of the Actuary.

Source: Health Care Financing Administration, Office of the Actuary and Bureau of Data Management and Strategy.

Table 8.11

AVERAGE ANNUAL RATES OF INCREASE  
IN MEDICARE HI, SMI, AND TOTAL BENEFIT PAYMENTS

<u>Program</u>	FY 1977-82		FY 1982-83		FY 1983-86	
	<u>Nominal</u>	<u>Real</u> <sup>a</sup>	<u>Nominal</u>	<u>Real</u> <sup>a</sup>	<u>Nominal</u>	<u>Real</u> <sup>a</sup>
HI Benefit Payments:						
o Total	+17.9%	+ 7.3%	+14.0%	+10.2	+ 7.5%	+ 4.0%
o Per Enrollee	+15.3	+ 4.9	+12.1	+ 8.4	+ 5.6	+ 2.1
SMI Benefit Payments:						
o Total	+19.1	+ 8.4	+19.1	+15.1	+13.8	+10.1
o Per Enrollee	+16.4	+ 6.0	+16.7	+13.2	+11.7	+ 7.9
Total Benefit Payments:						
o Total	+18.2	+ 7.6	+15.5	+11.6	+ 9.5	+ 5.9
o Per Enrollee	+15.6	+ 5.2	+13.5	+ 9.7	+ 7.5	+ 4.0

<sup>a</sup>In calendar year 1967 dollars, deflated by the average Consumer Price Index for all items for all urban consumers for the Federal fiscal year.

Source: Health Care Financing Administration, Office of the Actuary.

Taking into account the number of Medicare enrollees, the PPS period has seen a steep decline in the real rate of growth of Medicare benefit payments: HI payments increased at a real rate of only 2.1 percent in the first 3 years of prospective payment, compared to an average of 4.9 percent before TEFRA. SMI payments per enrollee have increased faster under PPS, however (7.9 percent annually, compared to 6.0 percent immediately prior to TEFRA). Total Medicare benefit payments per enrollee are increasing at a slightly slower rate under PPS (4.0 percent, compared to 5.2 percent in the pre-TEFRA period). Despite the slower rate of increase under PPS, real Medicare benefit payments per enrollee are still 12.6 percent greater than they were when prospective payment began.

#### Summary and Conclusions

The first part of this chapter contained an analysis of several aspects of program operations under PPS. This analysis indicates that the new system is essentially in place, with 48 States and the District of Columbia under prospective payment, including some 84 percent of all Medicare participating hospitals. In addition, plans have been developed to bring Puerto Rico under the nationwide system in FY 1988. The number of hospitals and units that have been certified as being excluded from prospective payment has been growing, while research is being conducted on how best to include these hospitals under PPS.

In order to monitor the appropriateness, necessity, and quality of care under PPS, 54 PROs have been established, and these PROs have been reviewing medical records in an attempt to detect problems in the way that medical care is provided to Medicare beneficiaries and billed to the program. A SuperPRO has been established, to review the performance of the PROs.

Data on PRO denial rates indicate, however, that there is wide variation in the stringency of PRO review. SuperPRO data further indicate that there is similarly wide variation in the success of the PROs in detecting problems that are indicated by the medical records that they review. The FIs, whose primary responsibility is the processing and paying of Part A claims, also are responsible for coverage determinations and some medical/utilization review. There is wide variation in FI denial rates, as well, which affects Medicare payments for skilled nursing and home health care, as well as hospital care.

These findings may lead to several alternative conclusions: they may reflect differences in local health care practice; they may reflect differences in the stringency of local PRO or FI review; or they may reflect differences in the level of performance of the local review entities. In any case, it does not appear that such local variation is consistent with the objectives of a nationwide system such as PPS.

The second part of this chapter reviewed the pattern of Medicare benefit payments since the implementation of the program in FY 1967, with a comparison of the period immediately preceding the implementation of the TEFRA payment provisions (FY 1977-82), the year that TEFRA was in effect (FY 1983), and the first 3 years of PPS (FY 1984-86). It must be pointed out that these data cannot definitively establish the role of PPS in causing whatever changes are observed, for several reasons:

- o As indicated throughout this report, numerous other changes in the health care system were occurring during the TEFRA and PPS periods;
- o Although 84 percent of all Medicare hospitals were participating in PPS by the end of FY 1986, changes affecting the other 16 percent may have had some affect on Medicare payments; and

- o A significant amount of Medicare payments to hospitals still involves cost-based reimbursement (for capital, direct medical education,<sup>2</sup> and organ acquisition costs), and thus is not under the control of prospective payment.

However, several conclusions, albeit somewhat tentative, may be derived from the data presented herein.

PPS appears to have slowed the rate of increase in Medicare inpatient hospital benefit payments. Although this increase is still above the general rate of inflation, it represents a downturn in the rapid growth of inpatient hospital payments that was seen as a major threat to the solvency of the Medicare Trust Funds.

The real rate of growth in outpatient hospital payments under PPS is far greater than their pre-TEFRA growth rate. This may indicate that some of the savings on inpatient services under PPS are being spent on outpatient services. Physician payments have increased at a somewhat slower real rate under PPS than in the pre-TEFRA period, but this slight decrease may be due to the Medicare physician fee freeze that was in effect for much of the first 2 years of PPS.

Skilled nursing payments have comprised a steadily decreasing share of total Medicare benefit payments since early in the program's history. Skilled nursing payments have increased under PPS at a slower rate even than inpatient hospital payments, but, when compared to the decrease in these payments in the pre-TEFRA period, this may indicate an upturn. The share of

---

<sup>2</sup> Effective for cost reporting periods beginning on or after July 1, 1985, reimbursement for the direct costs of graduate medical education for interns and residents is to be on a per intern and resident basis, rather than a reasonable cost basis.

home health payments has increased rapidly over the years, however. The real rate of increase in home health payments under PPS is slightly higher than it was in the pre-TEFRA period. That the combined share of skilled nursing and home health payments has increased under PPS may be a response to the expected increase in the demand for post-hospital sub-acute care, but it is hard to tell from payment data alone (see Chapters 5 and 7 for more detailed discussions of this issue).

The overall level of Medicare benefit payments is increasing at a slower rate under PPS, due to a sharp decline in the growth of HI payments, while SMI payments are increasing at a somewhat faster real rate than before TEFRA. Medicare benefit payments per enrollee have increased at a real rate that is only about three-quarters of their pre-TEFRA growth rate.

## REFERENCES FOR CHAPTER 8

Hassol, A. "Medicare Program Operations: Denial Rates Among Fiscal Intermediaries and Peer Review Organizations." Unpublished working paper. Cambridge, Massachusetts: Abt Associates, Inc., April 1987.

U.S. Department of Health and Human Services. Report to Congress: The Impact of the Medicare Hospital Prospective Payment System, 1985 Annual Report. Washington, D.C.: 1987.

CMS LIBRARY



3 8095 00005947 3

1986